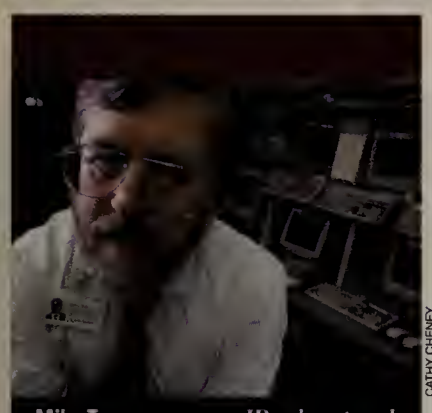
MARCH 24, 1997 VOLUME 14, NUMBER 12

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING



CATHY CHENEY

Mike Truman *says an IP-only network reduced net complexity for the Oregon Department of Corrections.*

IP-ONLY *spoken here*

By Michael Cooney

If ridding all protocols from your backbone but TCP/IP sounds like the impossible dream, take heart. A small but growing number of companies are living the fantasy.

Take, for example, the Oregon Department of Corrections in Salem, which is about halfway through implementing a Windows NT server-based environment linked via a TCP/IP backbone. It is a two-year project that will ultimately migrate about 3,000 users.

The new penitentiary net will replace an SNA/5250 net linking IBM Application System/400 machines, although the two will coexist for the near future.

"We were looking to reduce complexity and build a network that would let us add users and

See IP, *page 16*

No defense against latest hacker tool?

By Ellen Messmer
Orlando, Fla.

Hackers have discovered a tool for breaking into corporate networks and tampering with data that security experts say is virtually impossible to detect or defend against.

The software, TTY-Watcher, is a freeware version of a product that En Garde Systems, Inc. sells to companies that want to monitor internal network activity. Some of the 'Net's more sinister denizens, however, are telnetting into corporate nets and using TTY-Watcher to monitor a user's net session, kick the user off, then take over the session.

"TTY-Watcher allows an attacker with even a small amount

See Hacker tool, *page 72*

OpenView module faulted

By Jim Duffy

Hewlett-Packard Co.'s OpenView users are insisting the company change or replace the management system's software license component because it is too complicated to set up and use.

Several users have expressed frustration, even anger, with OpenView's license manager, iFOR/LS. The product, manufactured by Marlborough, Mass.-based Gradient Technologies, Inc., allocates OpenView licenses to clients and servers on a network and tracks the software's usage to enforce licensing terms.

In 1995, HP implemented iFOR/LS in OpenView Network Node Manager 4.0 in 1995 to enhance license allocation and tracking across client/server environments. But users now yearn for simpler days.

"I have no desire to have any more experience [with iFOR/LS]," said Loran Cavano, a consultant at Ralston Purina Co. in St. Louis. "In my opinion, it was a little overcomplicated, and if I had had a choice whether to use it or not, I certainly would not have used it."

Users complain iFOR/LS:

See OpenView, *page 72*

Oracle builds IBM MQSeries into database

By John Cox

Oracle Corp. is expected this week to announce a distributed messaging capability for its Oracle8 database, in beta test, which promises to simplify the development of sophisticated Internet/intranet applications.

This feature, based in part on IBM's MQSeries message-oriented middleware, will synchronize the complex communications between applications and databases in transaction-

See Oracle, *page 16*

Schmidt to put Novell on 'Net

Sun chief technology officer selected for Novell CEO post.

By Christine Burns
Orem, Utah

It has been a long time coming, but Novell, Inc. last week filled its top job, tapping Internet visionary Eric Schmidt as its chief executive officer.

Schmidt, a 14-year Sun Microsystems, Inc. veteran, will leave his chief technology officer post to become Novell's CEO and chairman on April 7. But he will make his first appearance as such today when he addresses thousands of the Novell faithful at the firm's annual BrainShare user conference here.

New Novell CEO
Eric Schmidt says the message is "Novell equals Internet."

Analysts, customers, business partners and Wall Street investors are anxious to hear Schmidt's ideas for reversing Novell's slide from industry leader to a beleaguered company widely perceived as having missed the Internet phenomenon.

"I have already shed that perception myself," Schmidt told *Network World* last week. "As of day one, I am going to be out there selling the message that Novell equals Internet."

Reaction to Schmidt, who is widely credited with popularizing Java, has been overwhelmingly positive. It is believed that his technical expertise and vision are just what the doctor ordered for filling the post left vacant by CEO Robert Frankenberg last August.

Who is Eric Schmidt?

But beyond the broad-brush assessments, who is Dr. Eric Schmidt, and how will his personality, talents and experiences shape Novell?

Well, for one thing, this guy is smart.

See Schmidt, *page 70*

Hooked on NOVONYX

In another effort to strengthen its 'Net reputation, Novell last week announced plans with Netscape to form a privately held company called Novonyx that will blend Netscape SuiteSpot servers with Novell's IntranetWare offering. See story, page 70.

Remember when you could pack a lot in one box and still save mo

Introducing a new line of

ney? We do.

martSwitches. A simpler way to work.

So you've been craving a switch that's both cost-conscious and supports your bandwidth-hungry end users? Introducing Cabletron's new line of Ethernet SmartSwitches specially designed for the wiring closet/workgroup market.

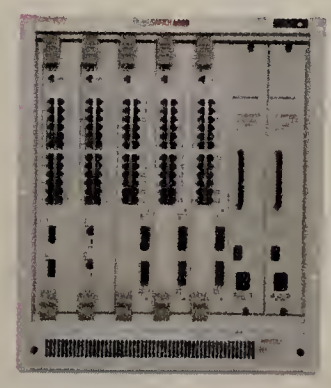
Each switch provides true plug-and-play capability for quick and easy set-up. Then you can expect the fast, reliable performance of an award-winning* switch family. Key features include Layer 3 switching with broadcast control and embedded per-port RMON. SecureFast™ advanced management applications allow for point-and-click adds, moves and changes, as well as enhanced security. You'll enjoy not only a lower cost-per-port (in many cases, lower than today's shared-access solutions), but reduced operating expenses over the long haul.

Choose the switch that fits. For big appetites, the SmartSwitch 6000 is a new 5-slot modular solution with distributed switching, fault tolerance and redundant power. A fully loaded SmartSwitch 6000 can provide switched Ethernet for up to 120 users with Fast Ethernet, FDDI and ATM connectivity.

On the lighter side, the SmartSwitch 2000 family of workgroup/desktop switches offers the same functionality as the 6000 in a standalone model. The new SmartSwitch 2200 is the first in this line and features 24 ports, two Fast Ethernet ports and a high-speed uplink for FDDI or ATM.

High-end features. Affordable price. Doesn't get much simpler. Take an early lunch break and call **603-337-0930** or visit us on the Web at **www.cabletron.com.**

SmartSwitch 6000



SmartSwitch 2200

*SmartSwitches named Editor's Choice in *Network Computing* magazine (1/15/97)

CABLETRON SYSTEMS

The Complete Networking Solution™

ew York Stock Exchange – Listed (CS)

Circle Reader Service #25

On the one hand, you need cable.

On the other hand, it better be

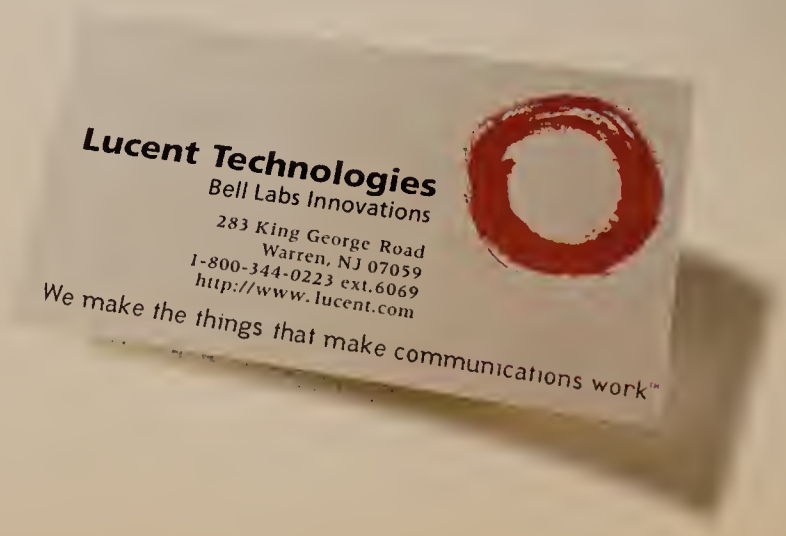
reliable.

Need a hand?

Nathaniel Stathum and
the team at Bell Labs
are ready to lend a hand.

SYSTIMAX® Structured Cabling Systems are one of the most proven premises network backbones in the world. Our fiber optic, copper, and wireless solutions exceed industry (TIA/EIA) standards. Real world testing, with real applications, helps prevent costly down time. Bell Labs innovations. Global installation and support. Unsurpassed 15-year Warranty. When would you like us to start?

CONSULTING . . . INFRASTRUCTURE . . . SOFTWARE . . . RISK SHARING . . . SERVICE . . .

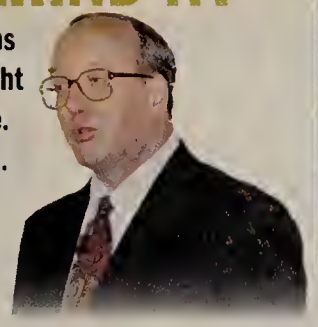


RAPID RESPONSE

Start-up Rapid City's FIRST 1200 backbone chassis promises to route and switch at high speeds. Page 29.

HP FULLY BEHIND NT

HP's Platt joins Gates in NT fight for enterprise. Page 6.



UUNET TO SELL IDSL

UUNET's Ron Vidal touts fast Internet access option that uses existing copper wiring infrastructure. Page 23.

PHOTOS (L): CINDY CHARLES

NetworkWorldContents

March 24, 1997 Volume 14, Number 12

News

WANs & Internetworking

Carrier Services

Local Networks

Intranets are a touchy subject for International Creative Technologies. Page 73.

Client/Server Applications

Intranets & the 'Net

SPECIAL FOCUS:
WEB SERVERS
Is free better? **Page 44.**

Technology Update

Management Strategies

Opinions

FEATURES

10 TIPS FOR BUILDING AN ATM NET:

Practical advice about how to get your project off the ground. **Page 51.**

REVIEW: GETTING A JUMP ON TAPE BACKUP

New tape drive technology that keeps things hopping. **Page 55.**

FIND IT ON FUSION

To quickly get to any online info referenced in *Network World,* enter its DocFinder number in the input box on the home page.

This Week

Only on Fusion

- **Censorship.** Get the details on last week's Supreme Court hearing on the Communications Decency Act, including a transcript of the arguments. **DocFinder: 1228**
- **Bandwidth.** Solving bandwidth crunches on TCP/IP networks will take smarter networks better able to handle complex data types, such as multimedia, rather than simply adding larger pipes, a panel of network executives said last week. **DocFinder: 1229**
- **Operating systems.** Download a transcript of an interview with SunSoft executive Ed Zander on the future of Unix and other topics. **DocFinder: 1224**

This Week

- **Security.** Know what you're up against? Download a variety of hacking tools to test your network. **DocFinder: 1226**
- **Backbones.** Download a paper on how to gradually migrate from SNA to TCP/IP on the backbone. **DocFinder: 1223**
- **Management.** Read what HP plans for its OpenView platform and what users think. **DocFinder: 1225**

New on Fusion

We're adding a sitewide search engine to make it easier to find just what you're looking for on Fusion. Click on Search to bring up this new information tool – and to search through our archive of issues, dating back two years.

HOW TO GET ON TO NETWORK WORLD FUSION

At the welcome screen, click on First Visit and follow the instructions. Subscribers, keep your NWF number – highlighted on the front cover's mailing label – handy during registration. Non-subscribers must fill out an online registration form.

NetworkWorld Fusion

www.nwfusion.com

How to contact us

WRITE: Network World, 161 Worcester Road, Framingham, MA 01701. **CALL:** (508) 875-6400; **FAX:** (508) 820-3467; **E-MAIL:** nwnews@nww.com; **CIRCULATION:** (508) 820-7444; nwcirc@nww.com

News briefs, March 24, 1997

Cisco stretches into DSL market

Cisco Systems, Inc. this week is expected to announce its entry into the Digital Subscriber Line (DSL) market with an inexpensive way for telephone companies to support ISDN DSL, a dedicated service limited to 128K bit/sec. All a telco would have to do is plug a new Cisco card into an existing D4 channel bank, sources said. Users would have to buy an ISDN terminal adapter. Later this year, the Cisco cards will support High-bit-rate DSL, which has a top speed of 768K bit/sec. The card could delay the need for the central site multiplexer that telcos have been looking for to aggregate DSL traffic.

Court hears CDA case

U.S. Supreme Court justices last Wednesday grilled lawyers arguing a U.S. Department of Justice appeal of a 1996 ruling that overturned the Communications Decency Act (CDA). Justice Department attorney Seth Waxman said the CDA is needed to protect children from indecent material on the Internet. He also said content providers can screen Web site users to ensure they are not minors by using credit card numbers or services that issue adult IDs. Bruce Ennis, the attorney arguing on behalf of the anti-CDA forces, said the proposed law violates the protected rights of free speech for adults. The court is expected to rule on the appeal in June.

Olicom to buy CrossComm

Olicom A/S last week agreed to acquire struggling SNA router vendor CrossComm Corp. for about $90 million in stock. The acquisition will bring together Olicom's token-ring and ATM switches and network interface cards with CrossComm's multiprotocol routers. The combined company will provide SNA/token-ring customers with a migration path to ATM, analysts said.

IBM, Intel join forces on messaging

IBM, Intel Corp. and other industry leaders next month will announce a strategy for advancing what they call Business Quality Messaging (BQM), a technology for moving essential messages across intranets. The BQM initiative is intended to extend the reliability of transactional messaging to applications such as E-mail, scheduling, document management and workflow. It will be introduced at the Electronic Messaging Association's annual conference in Philadelphia.

Mr. Smith goes to New York

Facing the last regulatory hurdles before the Bell Atlantic Corp. merger with NYNEX Corp. can be completed, Bell Atlantic Chairman and Chief Executive Officer Ray Smith last week outlined plans to bolster bandwidth for customers throughout the region covered by the new telecommunications behemoth he will soon be heading. Speaking at the Internet Electronic Commerce conference in New York, Smith said increasing broadband services to customers is a top priority. The increase will take place in three phases with three different technologies: ISDN, Asymmetric Digital Subscriber Line and switched broadband technology. New York regulators last week approved the merger but will force the company to hire up to 1,000 additional employees by year-end to improve service. The deal still needs Federal Communications Commission and U. S. Department of Justice approval.

Smith

Java hits standards trail

Sun Microsystems, Inc. last week took the first step toward making its Java technology an international standard by applying to the ANSI Joint Technical Committee for recognition as a publicly available specification submitter. This would let Sun submit the Java specification to ANSI without having to see it dissected by a standards committee review, which is the usual course before it ends up at the Geneva-based ISO.

HP lends NT a hand

By Christine Burns
Palo Alto, Calif.

Microsoft Corp. and Hewlett-Packard Co. last week announced a slew of partnership agreements that all center on a common goal: elevating Windows NT from a workgroup server to a true enterprise operating system.

The agreement touches on everything from keeping the total cost of NT machine ownership in check to integrating HP's enterprise management and messaging products with NT-based ones. It also includes HP shipping NT-clustered systems and NetPCs, as well as arming 5,000 members of its service organization with NT system expertise.

"HP brings the enterprise clout to Microsoft," said HP Chief Executive Officer Lou Platt. In return HP gets to ride the rising popularity of NT, he said.

However, fellow Unix vendor Sun Microsystems, Inc. criticized HP's embrace of NT as a move to separate itself from Unix.

"HP is clearly backing away from HP-UX, HP's commitment to the 3DA, and the future of Unix altogether," said Remy Malan, group product manager for Sun's SunSoft division. 3DA is a Unix-based modular 64-bit architecture that HP and The Santa Cruz Operation, Inc. have been working on since 1995. It is supposed to offer customers a large-volume Unix operating system with a dominant market share and heavy independent software vendor support.

HP sticks to Unix

HP begs to differ, arguing that this NT support will not affect its commitment to its Unix-based HP-UX operating system.

Gates *thanks HP's Platt for his support.*

"We are not getting involved with the operating system holy wars. We are a $32 billion company and we can — and will — successfully execute a strategy based on two operating systems," said Platt.

HP will continue its development of an HP-UX port that runs on the 64-bit Merced chip it is helping design with Intel Corp.

This arrangement is one of the most significant Microsoft has made regarding enterprise NT deployment since it signed a similar pact with Digital Equipment Corp. last year. Microsoft CEO Bill Gates brushed off charges that this new alliance would affect Digital's business. He said NT is steadily moving into big corporations and the call for support in those accounts exceeds what Digital can deliver.

Joe Clabby, research director with Aberdeen Group, Inc. in Boston, agreed. He added, however, that Compaq Computer Corp. could be affected by this partnership. While it is a huge supplier of NT systems, Compaq lacks enterprise support, he argued.

Others question whether HP, Digital or Compaq will be able to consistently push NT into enterprise accounts when Microsoft has yet to deliver several enterprise operating system requirements such as clustering, advanced security and a scalable directory service.

"The spin on this is that NT is going to run the world with HP's help. That's a huge leap of faith," said Thomas Rhinelander, an analyst with Forrester Research, Inc. in Cambridge, Mass.

The list of joint initiatives announced includes:

- HP's support of Microsoft's Wolfpack clustering technology.
- Increased integration of OpenMail and Exchange messaging products.
- HP's support of NT Server via OpenView management products. ■

Dynamic HTML vs. dynamic HTML

By Carol Sliwa

Microsoft Corp. last week rallied a bunch of software vendors, including Borland International, Inc. and the Powersoft division of Sybase, Inc., around its version of dynamic HTML.

It is not to be confused, of course, with the "dynamic HTML" that rival Netscape Communications Corp. promotes on its Web site.

A bit confusing?

Asked for his opinion on dynamic HTML, one industry analyst quipped, "Which one?"

Why care? Many industry analysts are quite impressed by dynamic HTML technology. With it, any element of a Web page can be changed without the browser having to fetch a new page from the Web server.

Simply moving a cursor over a headline can produce a near instant change in its color, for instance. A table of contents button can suddenly expand to a full display of headings.

"Both Netscape and Microsoft are trying to do the same thing. What would be nice is if both are based on a single standard, as opposed to having to have separate browsers to activate one vs. the other," said Tim Bajarin, president of Creative Strategies, Inc.

As far as the nomenclature goes, the water got muddy when Netscape, at the end of January, decided to start using the term dynamic HTML, an expression that Microsoft had been using publicly since last October.

"We didn't think it would cause confusion," said Netscape product manager Daniel Klaussen. "It wasn't until afterwards that we realized that Microsoft was using this as a term to mean something specific in their product, since it has been used as an adjective by both companies for some time."

Both companies consider dynamic HTML to be an umbrella term that includes several standards and proposed standards, including HTML 3.2, Cascading Style Sheets 1.0 and absolute positioning.

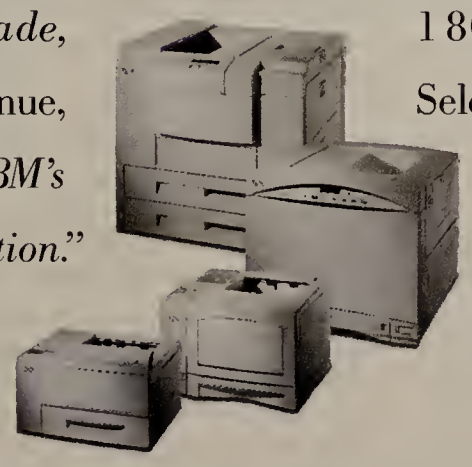
Microsoft also includes the Document Object Model that it

See **HTML,** *page 8*

PC World says
our Network Printer
tops the others.

Maybe editorial comment
is more credible than advertising.

In their March issue, PC World ranks the IBM® Network Printer 12 the number one network monochrome printer. Editors say, *"IBM's inexpensive monochrome laser prints very good text and gray scale images. With its RAM upgrade, graphics come out faster, too."* They continue, *"Smaller offices will appreciate the IBM's compact size and relatively quiet operation."* They go on, *"IBM's strong service and support policies include round-the-clock toll-free phone support."* If you like what you read here, chances are you'll love our Network Printers. Visit us on the Internet at www.printers.ibm.com or just call IBM Printing Systems Company at 1 800 358-6661 and choose Printer Selection Center. There's never been a better time to check out Network Printers from IBM.



Solutions for a small planet™ IBM®

MCI tests new national plan – in northwest Iowa

By Tim Greene
Sergeant's Bluff, Iowa

This unlikely spot come to be known as the birthplace of broadband services for the masses.

Last week, MCI Communications Corp. announced an alliance that, in some cases, will let customers buy bundled telephone services, security monitoring and cable TV.

"It's a model we hope to replicate throughout the country," said networkMCI Services President John Gerdelman.

The effort starts in northwest Iowa where three distributors have been signed up to handle the MCI services. MCI claims it is already negotiating with 300 more distributors in 10 states.

The plan calls for piecing together local networks from existing infrastructure, adding broadband technology and linking that to MCI's network.

For example, one Iowa town's local fiber/coaxial cable network will be linked to a regional fiber-optic network owned by an electric utility. Traffic will be backhauled to a local telephone switch and, if a long-distance link is needed, dropped onto the national MCI network.

That way, MCI does not have to install its own wires and switches, and it can deliver services sooner and with less investment, Gerdelman said. The whole service package is marketed by third-party vendors.

One of the first such distributors is the city of Manning, Iowa, which already runs a utility company that sells water, sewer service and electricity. It will build a hybrid fiber and coaxial cable network over which it will resell services it buys from the MCI group. It could also add more of its own services.

Howard Roe, a local banker who sits on the Manning Area Development board, said the town hopes to use the network to replace recently lost factory jobs.

The MCI blueprint will be executed by Pioneer Holdings, LLC, which is made up of MCI, Northwest Iowa Telephone (NWIT) and Northwest Iowa Power Cooperative (NIPCO).

US WEST, Inc. is also introducing broadband Digital Subscriber Line (DSL) services, but only to the largest cities in its territory. Pioneer will go wherever it can find someone to distribute the service.

Northwest Iowa has been the MCI test bed for DSL and cable modem technology, both offering broadband transport over existing copper and coax nets.

But during its trials, MCI found that Asymmetric DSL and cable telephony cost too much per line for widespread deployment. Noting that costs are coming down, MCI is in the process of tariffing the services in other locations to test markets. ■

BROADBAND TO THE FARM

MCI's rural initiative offers include:

- Local, long-distance and wireless services
- Digital Subscriber Line
- Internet access
- Direct broadcast satellite
- Network support and service

HTML

Continued from page 6

officially submitted in early January to the World Wide Web Consortium (W3C) for consideration as a standard. That's the piece that makes the HTML dynamic, according to Microsoft's Program Manager Thomas Reardon.

Everything on the screen, including every letter, is an object that can be manipulated and changed on the fly, Reardon said.

When a Web page is downloaded, a whole bunch of information arrives at a user's desktop. Some of it is displayed. The rest is stored in RAM.

The objects on the screen can be scripted to manipulate objects sitting in RAM, create new objects or kill old objects, Reardon said. The objects that have been acted upon can be made visible or invisible. No round-trip to the server is needed.

"Netscape's approach is more like a macro language," Reardon said. "You make a bunch of statements about different objects and when the page is loaded, all of those things are interpreted, just that one time, and the page will change at load time only."

You can have subpages — layers — which can move, but nothing inside a layer can change," he said. ■

AT&T deep into multibillion-dollar SONET upgrade

Investment is concentrated in long-distance network instead of emerging local businesses.

By David Rohde
Seattle

AT&T is pouring billions of dollars into a SONET catch-up drive, a top official told customers gathered here last week.

The carrier will achieve coast-to-coast connectivity via self-healing Synchronous Optical Network rings by year-end, increasing the number of SONET rings in its backbone from 11 to 30, said Frank Ianna, vice president and general manager for network and computing services. He was speaking at the Enterprise Network Technologies Users Association, a group of large corporate AT&T customers.

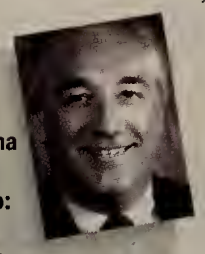
By the end of 1998, AT&T plans to have more than 50 rings in service, each with 2.5G bit/sec of broadband capacity. AT&T also will install wavelength-division multiplexing (WDM) equipment capable of splitting the 2.5G bit/sec path into eight separate frequencies, for a total potential throughput of 20G bit/sec.

AT&T's immediate need is to increase network capacity to handle growing traffic volumes. But Ianna said AT&T also hopes to meet competitors' claims of being able to restore users' voice and data traffic within milliseconds in case of a fiber cut or other outage.

Like other carriers, Ianna conceded that AT&T is unlikely to offer a universal instant-restoral guarantee as a result of its network upgrade.

But it could be used by product managers in developing more robust service assurance warranties.

The details of the SONET and WDM buildout emerged during Ianna's presentation on the $8 billion to $9 billion network expansion recently announced by AT&T President John Walter.



RETURN ON INVESTMENT

AT&T network chief Frank Ianna said the carrier will spend $8 billion to $9 billion this year to:

- Expand the number of SONET rings from 11 to 30.
- Boost the network's backbone capacity from 3.4G to 20G bit/sec.
- Continue buildout of AT&T's wireless PCS network.
- Introduce a system to reduce the time it takes to change call-handling features.
- Collapse frame relay, private-line and other data services onto an ATM backbone.

The moves place AT&T on the path already well-trod by its main rivals. AT&T lags behind MCI Communications Corp. and Sprint Corp. in providing millisecond restoral of outages on its backbone network, having only committed to SONET in mid-1995 and started construction in earnest last year.

Sprint already carries 47% of its backbone traffic on 41 main SONET rings, plus numerous additional point-to-point SONET segments. MCI has 36 backbone rings in operation, and has carried the concept down to the metropolitan area with 67 local rings in 35 cities, of which 19 cities are connected to MCI's local switches for commercial local service.

A key reason for accelerating the SONET deployment is AT&T needs additional capacity, Ianna said. Its backbone net speed of 3.4G bit/sec lags behind MCI's 10G backbone and requires upgrading.

But Ianna refused to say how much, if any, of the network investment is earmarked for building new local facilities. Except in Chicago, AT&T so far is relying on resale of other carriers' facilities to enter the switched local exchange business. ■

AT&T raises prices on private lines and frame relay services

By David Rohde
Washington, D.C.

AT&T last week increased prices on frame relay and private-line services, not only raising user expenses but also drawing attention to regulators' inability so far to end the practice of carriers changing rates in tandem.

The frame relay move, increasing port and permanent virtual circuit (PVC) prices an average of 5%, followed an unannounced move by MCI Communications Corp. last month to boost port charges. The AT&T action did not completely mimic the MCI change, since MCI actually reduced some of its PVC charges while increasing others.

Both companies' moves automatically increase costs for users on a term contract whose rates are indexed to basic tariff rates. A federal appeals court recently postponed implementation of a Federal Communications Commission ruling ordering long-distance carriers to cancel all their domestic tariffs.

In addition to boosting frame relay prices, AT&T also raised private-line and ATM prices. Particularly hard hit are users with high-speed services above T-1. AT&T's prices for T-3, fractional T-3 and ATM all rose 15% — the exception being a low-speed T-I port option on ATM, which was raised to 5%.

AT&T's frame relay move represented a reversal of direction. Last October it had lowered frame relay prices, but last week's move canceled out most of the benefit of that change (see graphic).

Steve Sobolevitch, AT&T's manager of data strategic pricing, said that since October AT&T has introduced several new frame relay options that required additional investment on its part.

He noted one in which a frame relay access device is placed in AT&T central offices to convert SNA traffic to frame relay without a large customer premises equipment investment by the user.

The heavy price increase on T-3 speed services is due to AT&T's multibillion-dollar investment in a Synchronous Optical Network upgrade and related expenses, Sobolevitch said (see story, this page).

Analysts were not impressed with that reasoning, especially since AT&T had just announced its first public ATM pricing at ComNet '97 here last month.

"This is what happens when the carriers are required to publish their rates, and they know what they have to do to meet the competition," said Ellen Block, a user attorney based here.

Senior Writer Denise Pappalardo contributed to this story.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 36 WEST KINGSTON, RI

POSTAGE WILL BE PAID BY ADDRESSEE

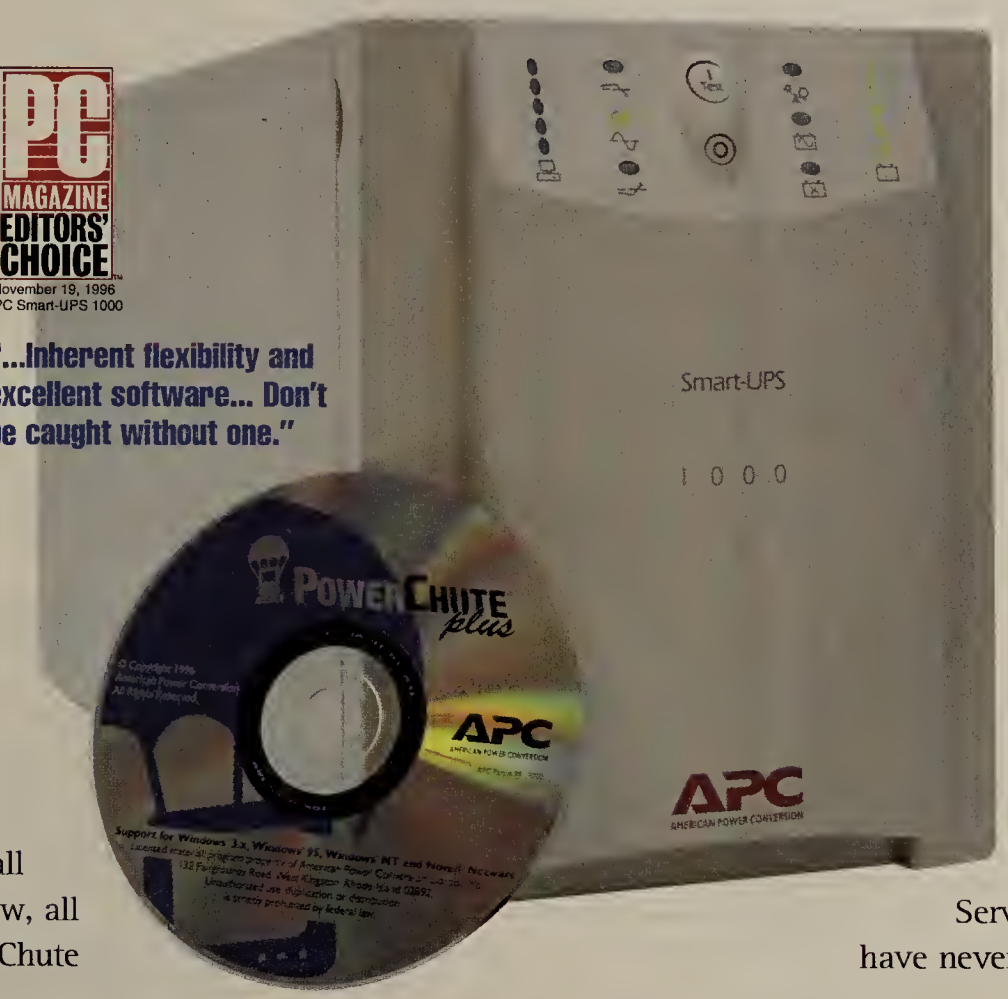
APC®
AMERICAN POWER CONVERSION

DEPT. BRC-E2-SU
132 FAIRGROUNDS ROAD
PO BOX 278
WEST KINGSTON RI 02892-9920

Now that APC Smart-UPS® includes FREE web-enabled PowerChute® *plus*, server protection has never been easier

PC MAGAZINE EDITORS' CHOICE
November 19, 1996
APC Smart-UPS 1000

"...Inherent flexibility and excellent software... Don't be caught without one."



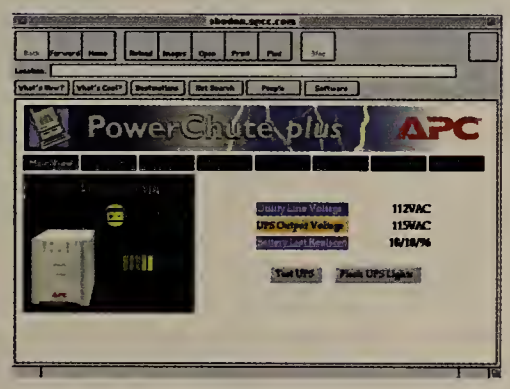
Protect ME! APC

Power problems attack networks relentlessly. To protect hardware and data from system crashes, experts, network managers and computer users worldwide prefer one solution above all others combined: APC Smart-UPS. Now, all 120V Smart-UPS include FREE PowerChute *plus* power management software.

The most reliable protection you can buy

Smart-UPS provide complete protection against power spikes, surges, brownouts, and blackouts. You'll also gain maximum server uptime and decrease management costs. Award-winning features include:

- CellGuard™ intelligent battery management monitors battery performance and extends battery life.
- SmartSlot™ internal accessory slot lets you customize and enhance the performance of your Smart-UPS.
- QuickSwap™ user-replaceable batteries can be quickly and safely swapped out without powering down the connected equipment.



PowerChute plus *provides unattended system shutdown and UPS management for Windows NT, Netware and other servers. Manage Smart-UPS via SNMP, DMI and Web browsers (shown above). Features vary by operating system.*

Plan for and control crisis situations

PowerChute *plus* FlexEvents™ lets you control UPSs reactions to power events. You can configure PowerChute *plus* to provide graceful, unattended server shutdown during an extended power outage or alert you to out-of-bounds environmental conditions before they result in costly downtime.

Web server & SNMP ready

APC's NEW WebAgent™ allows you to monitor and manage your Smart-UPS using your Web browser. New WebAlert™ notifies users of Web server shutdown via their browser. PowerChute *plus* also includes the PowerNet™ SNMP Agent plug-in, which allows you to integrate your Smart-UPS with your existing SNMP management strategy.

Smart-UPS and PowerChute *plus* provide the complete solution in one convenient box. Server protection and peace of mind have never been easier.

Trade-UPS!

Fax or mail this coupon to APC and learn how you can easily trade in your old UPS for discounts towards a new Smart-UPS.

☐ **YES!** I'm interested in trading up an older competitors' or APC UPS to Smart-UPS. Please send Trade-UPS info.

☐ **NO** I'm not interested at this time but please send my FREE power protection handbook.

Name: _____

Title: _____

Company: _____

Address: _____

City/Town: _____

State: _____ Zip: _____ Country _____

Phone: _____

How many servers on site? _____

Brand of UPS used? _____

Dept. E2-SU

APC®

(888) 289-APCC x7017
Fax: (401) 788-2797
http://www.apcc.com

APC has won more awards for reliability than all other UPS vendors combined.

IBM targeting multilayer switch market

By Michael Cooney
Raleigh, N.C.

IBM late this year will join the swelling ranks of firms, established players and start-ups that are making a run for the multilayered switch market.

The company will announce a product, tentatively dubbed Integrated Switch/Router (ISR), that will combine Layer 2 and Layer 3 routing and switching technology in a single high-speed box.

The product will be aimed at high-end users building large, switched backbones and Internet service providers.

No less than 10 vendors, including Bay Networks, Inc., Foundry Networks, Inc. and Rapid City Communications have promised similar multilayered switches to anchor high-speed, low-latency backbones.

"We'll be targeting those users who are completing the transition from route-based networks to switched-based environments," said Rick McGee, vice president of strategy and business development with IBM. "Our greatest differentiator will be our multifunction software, our scalability and the ability to aggregate multiprotocol traffic onto a switched, high-speed backbone."

The software in the ISR is expected to support IBM's IP switching technology, Aggregate Route-based IP Switching (ARIS), which will enable Layer 2 switching of IP packets. It will also support IBM's Multiprotocol Switching Services (MSS) software, which boasts an array of features from routing, traffic management and congestion control to ATM Virtual Channel Connection support.

McGee said exact product plans, such as speeds and interface feeds or which family of IBM switching products the ISR will fit into, has not been determined.

The ISR will contain an IBM Prizma-based ATM backplane, though McGee did not reveal the exact throughput specifications. IBM did, however, just announce a 12G bit/sec backplane for its 8260 Super Hub.

McGee said exact product plans, such as speeds and interface feeds or which family of IBM switching products the ISR will fit into, has not been determined.

"We are focusing on making the ISR scalable and capable of handling high-volume transactions," McGee said.

The switch is part of IBM's plan to reinvigorate its Networking Hardware Division products line and attempt to establish its products as the central components in new enterprise infrastructures.

Earlier this month IBM rolled out a slew of new switching modules and software that will help users set up and control large virtual LAN nets (*NW,* March 3, page 1).

"IBM has been classically behind by a year on most of their switches but with what they are working on now, IBM clearly would like to be out in front," said Frank Dzubeck, president of the Communications Network Architects, Inc. consultancy in Washington, D.C.

"Performance and software functionality will be the greatest differentiators in this market — though it's way too early to pinpoint a leader." ■

Start-up unveils tool for mining Web data

By Chris Nerney
San Ramon, Calif.

Start-up OnDisplay, Inc. says while there is gold on the Internet, it is too frequently buried beneath a pile of HTML coding.

The gold is valuable data from Web sites, the kind of information businesses in fast-changing markets need in order to stay competitive. However, because HTML essentially is a display language, much of this data is inaccessible to spreadsheets, financial modeling programs and other dynamic business applications that can give it real meaning.

So OnDisplay — formed last year by Sybase, Inc. alumni — has developed a product line for analyzing, filtering and organizing Web data from multiple sites.

CenterStage, which the company will announce today, provides the structural and procedural semantics that businesses can use to extract and process data from HTML documents on the World-Wide Web.

"We're giving you the opportunity to do something with the information besides read it," said Lloyd Brogan, OnDisplay's vice president of marketing and business development.

Using CenterStage, businesses such as financial brokerages — whose employees can spend hours individually accessing market data on the 'Net — could retrieve information from as many Web sites as desired and feed it into spreadsheets or other applications, OnDisplay officials said.

PROFILE: ONDISPLAY, INC.

Based:	San Ramon, Calif.
Founded:	1996
Investors:	Matrix Partners and Atlas Venture
Management team:	Mostly former Sybase executives
Products:	CenterStage – business applications software

The heart of CenterStage is PageAgent, which is JavaScript-based software that lets users define and collect specific information they need from the Web, said Mark Pine, OnDisplay president and chief executive officer.

Besides HTML, PageAgent supports ActiveX and Open Database Connectivity, and can work with Netscape Communications Corp. E-mail, Pine added.

CenterStage products include an application developer, a server, and a client, as well as WebAnalyst, a browser-oriented interface that enables users to manipulate data gathered from Web pages.

CenterStage for Windows 95 and NT is scheduled to be available in June, with a Unix version slated for release in September.

Pricing is as follows: Center Stage Developer, $995; Center Stage Server, $9,995 to $39,995; CenterStage Desktop, $295 per user; and CenterStage WebAnalyst, $39.95 per user.

✆ OnDisplay: (510) 355-3200.

Investment options run gamut in net industry

By Chris Nerney

Electronic commerce and security. Remote access and wireless data. Photonic networks and bandwidth expansion.

Those were the network technology markets most frequently cited by venture capitalists interviewed by *Network World* as likely to draw heavy investment funding in 1997.

But no matter what particular markets they favored, the venture capitalists agreed on one thing: Millions of dollars will continue to flow to start-up Internet and network technology companies, particularly from private investors.

WHERE THE VENTURE FUNDING IS GOING IN '97

Todd Dagres
Battery Ventures

- Wireless data networks
- Network management
- Optical networks
- Intelligent networks
- Internet/intranet integration

Jim Millar
Early Stage Enterprises

- Remote networks
- Wireless data
- Electronic commerce

Tim Draper
Draper Fisher Associates

- Intranets
- Electronic commerce
- Security
- Bandwidth
- Optical technology

"People are going to be betting money across the board," said Jim Millar, a partner with Early Stage Enterprises of Princeton, N.J.

The common thread linking the technologies touted by venture capitalists is their attempts to address major problems impeding the business use of networks, intranets and the Internet, such as inadequate security for online transactions, poor remote access capabilities, data transmission speed and bandwidth congestion.

Todd Dagres, a partner at Battery Ventures in Boston, said he "likes to invest where there's the most pain." And Dagres sees a lot of pain in the area of mobile data communications. "Today, mobile data networking is abysmal," he said. "One issue is bandwidth, another is service quality."

Fortunately, Dagres said, need for improved mobile remote data connectivity has spawned "a lot of innovation. There. . .are about 20 companies pursuing wireless data."

Among the start-ups working the remote and wireless side of the street is Chicago-based Cruise Technologies, Inc., which is developing software that allows wireless access to thin-client remote terminals.

Millar agreed there is "real opportunity" in remote networking and wireless data. "With the mobility of the workforce and the emergence of the portable device market, there will be a need for wireless data products," he said.

Millar cited Nettech Systems, Inc. of Princeton, N.J., as an innovator for its development of InstantRF, which gives developers tools to build mobile applications that are scalable across the enterprise and bandwidth-efficient.

Remote access and electronic commerce start-ups will continue to attract venture capital, said Don Gooding of Accel Partners, based in San Francisco and Princeton. He also said "networking boxes for carriers are going to be a big part of '97."

"Competition in the local loop, the emergence of ISPs and wireless carriers and the growth of international competition are fueling a very substantial market for early-stage companies to develop strategic weapons for the new carriers," he said.

"Within the backbone of the Internet, there's a need to relieve congestion and add more bandwidth," said Andy Rachleff of Benchmark Capital in Menlo Park, Calif. "So you're seeing a big increase in attention to very high-speed routers, multicasting and quality of service."

Draper Fisher Associates of Redwood City, Calif., is among the venture firms investing in companies focused on improving network infrastructures.

"Anything that will improve the bandwidth or the speed at which you can do all this stuff on the Web is going to be very valuable," said Managing Director Tim Draper. ■

If a problem is taken care of before it becomes a problem...

did it ever exist?

The snag with so many of today's distributed computing environments is the number of problems that seem to get distributed around the environment.

In the old days of file-and-print LANs, networks ran themselves. Today, with multiple protocol, interconnected LANs and WANs, managing a network can be a 24-hour-a-day pain in the neck. But it doesn't have to be, not with our around-the-clock, seven-days-a-week monitoring program. In fact, since acquiring SHL Systemhouse℠ (recognized by industry analysts as a leader in client/server computing), we've built quite a reputation in distributed computing systems. To the point that *Data Communications* magazine just voted our enterprise management service, with its end-to-end, 24/7 service and support, one of their "Hot Products" for 1997. But that's just one of the very many programs we have to help you.

Check out the others at www.mci.com or call 1-800-338-6815 and start getting taken care of.

Is this a great time, or what? MCI

Chief Bay architect shares his vision

VP Bill Hawe hints at remote access, Layer 3 switch and high-end router plans.

Q&A The "new" Bay Networks, Inc. will be introduced in about a month, so who better to give a preview than Bill Hawe, the company's new vice president of architecture? Hawe, who added life to Digital Equipment Corp.'s Network Product Business in his previous job, last week shared his vision for Bay with *Network World* Senior Editor Jim Duffy in Billerica, Mass.

What's your charter as vice president of architecture?

It's trying to add value through a product architecture that goes across the lines of business. [This involves] developing new ingredient technologies, whether that's core technology for a really high-speed router or interesting and profitable new lines of business that a start-up might have gone off and done.

When I think of architectures and Bay, I think of the BaySIS blueprint for switched internetworks. What's the latest on BaySIS?

BaySIS was a pretty broad blueprint. No area was left uncovered. What you'll see Bay do is really sharpen the focus.

Can you drill down into some of the aspects of this new focus?

I'm not going to preempt a lot of other people's work here, but [I'll] give you something about the direction. The cost to support employees with remote access networks is going up. So [customers are] saying, "That's as important to know as how I'm going to move the bits." Bay's going to be responsive to that in a variety of ways.

Another major trend is enterprise switching. Level 2 and 3 performance is getting equalized. All of the Gigabit Ethernet start-ups are working on their Level 3 switching story and technology, as are Bay, Cisco and all the major established network companies.

Another trend relative to this is [virtual] LANs. You'll see a more pragmatic, simple set of VLAN capabilities come out.

Any plans to address Layer 3 switching for WANs?

Bay has products under development that are aimed at WAN/high-end switching and will involve Level 3. The problems may be: How do I achieve very high packet-forwarding performance and scalable routing implementations so I can support a lot of routes and move routes very efficiently? In some topologies that's the bigger problem than the short-circuiting issue that you saw on the local network.

The short answer is yes, you're going to see a series of Level 3 switching technologies aimed at the wide area from Bay; the more subtle one is some of the problems in that market are actually a different problem set. You're going to see a series of rollouts and plans in the coming months.

Where do you take the Backbone Node [BN] router from here?

There are a series of technologies in development for that product, [though] I don't think that platform will last forever. Bay hasn't announced its transition plan, [and] I'm not in a position to announce [it]. There are fairly major increases in functionality being developed that will come out shortly.

Is Bay working on an equivalent to Cisco's BFR, its planned high-end router?

I don't know what Cisco's BFR is, so I'm not sure that what Bay is working on is its equivalent or not.

It's pretty clear that there's a need for High Performance Routing. High performance again doesn't just mean how many packets per second can be forwarded; it means: Does it have the dynamic behavior? Does it crash when it's overloaded with data? Does the routing process remain stable independent of the data traffic? Can I add or remove routes quickly or does it take 10 or 20 minutes?

Everyone fixates on the forwarding process but other things really control the stability of your network. Bay is going to respond to that market.

Can you give us a ballpark figure on performance numbers, and insight into the architecture of this new device?

Nope. There are some technologies in the BN that the company's well-advised to carry forward that relate to some of its historical core competencies. You'll see the lower layer hardware system being different — a more contemporary switching system.

What are your thoughts on the Network Interoperability Alliance (NIA) formed by Bay, IBM and 3Com Corp.?

There's goodness in the goal — that is to try and have some set of things that people agree on to be interoperable and implemented. The NIA has maybe drifted a little bit over time. Customers are looking for a little more focus. So the challenge for the NIA is to maintain its mission of promoting interoperability and to achieve that, but keep a little bit better eye on what the customers really want. ■

Cisco plans to speed up Fast Ethernet networks

By Jim Duffy
San Jose, Calif.

Cisco Systems, Inc. last week unveiled proprietary technology for aggregating bandwidth among multiple Fast Ethernet links and migrating users to Gigabit Ethernet.

Fast EtherChannel is an outgrowth of the switched Ethernet bandwidth aggregation technology Cisco inherited from Kalpana, Inc. when it acquired the company in 1995. The technology combines parallel, full-duplex 100M bit/sec links into a high-speed trunk of up to 800M bit/sec between switches, routers and servers.

Fast EtherChannel software is intended to provide users with a stepping stone to Gigabit Ethernet. Cisco is not expected to ship Gigabit Ethernet products until early 1998, after the IEEE 802.3z Gigabit Ethernet standard is defined.

Cisco will provide Fast EtherChannel options for its Catalyst 5000 LAN switches and 7500 routers in the second half of this year.

Fast EtherChannel software will provide load sharing and fault tolerance across aggregated links, said Jayshree Ullal, vice president of Cisco's Workgroup business unit. Cisco has also developed the Port Aggregation Protocol, which Ullal said automates creation and configuration of Fast EtherChannel links.

"The part I really like about it is the scalability in terms of being able to go from 100M bit/sec right on up in increments of two [100M bit/sec links]," said Lynn DeNoia, director of consulting services at Strategic Networks Consulting, Inc. in Rockland, Mass. "It's a great migration path while people wait for Gigabit Ethernet to get standardized."

Cisco's Fast EtherChannel friends

- Adaptec
- Compaq
- HP
- Intel
- NetFRAME
- Silicon Graphics
- Sun
- Xircom

Fast EtherChannel's appeal will be limited to Cisco switch and router customers, extensive as that base may be, DeNoia added.

Other analysts said the technology's introduction could hurt sales of products from some of the many Gigabit Ethernet start-ups, as well as from Cisco's ATM business unit.

"Cisco customers who were maybe thinking of [getting a Gigabit Ethernet] switch from one of the start-ups will probably reconsider," said John Armstrong, principal analyst at Dataquest, Inc., a market research firm in San Jose, Calif. "On the ATM side, the LightStream people at Cisco must be ripping their hair out because this is going to ding ATM as well."

© Cisco: (408) 526-4000.

Satellites ready for data service launch

By Denise Pappalardo

Imagine your company's voice and data services coming from a network without wires. While this concept may be a long way away, organizations such as Iridium LLC and Teledesic Corp. are starting to make progress.

Iridium filed for its initial public offering (IPO) last week, and Teledesic was awarded the first Ka-band license from the Federal Communications Commission.

Iridium is a consortium of 18 companies, including Lockheed Martin Corp., Motorola, Inc. and Sprint Corp., that is trying to build on the $2.65 billion in funding it has already raised. The Washington, D.C.-based satellite company filed with the Securities and Exchange Commission to sell as many as 10 million shares in its IPO at an estimated $19 to $21 per share.

Iridium plans to offer users an alternative to their existing mobile voice services and plans to have it available in September 1998. The company's 66 satellites will link users around the planet even if they are in the middle of Death Valley or a rainforest in Brazil.

But first the satellites must be launched and that has not been easy. The first Iridium rocket was slated to launch five satellites in January, but the rocket

See **Satellites,** *page 16*

FREE Switching Whitepaper!

Call 1-800-457-8211 or mail this card today and learn how to make the move from shared to switched networks effectively with our in-depth "Migrating to Switched Networks: Technology Choices; Business Decisions" whitepaper, authored by an industry expert on LAN switching.

☐ **Please send me the whitepaper, "Migrating to Switched Networks: Technology Choices; Business Decisions."**

☐ **I would like to talk about improving my network performance. Please call me.**

☐ **Please send me more information about DIGITAL switching solutions.**

☐ **Please send me more information on the new 0% leasing program on select switching products.**

BFJ

Name _____

Title _____

Company _____

Type of Business _____

Address _____

City _____ State _____ ZIP _____

Phone ( ) _____ E-mail _____

digital™

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO 79 WESTFORD MA

POSTAGE WILL BE PAID BY ADDRESSEE

digital™

DIGITAL EQUIPMENT CORPORATION
PO BOX 687
WESTFORD MA 01886-9902

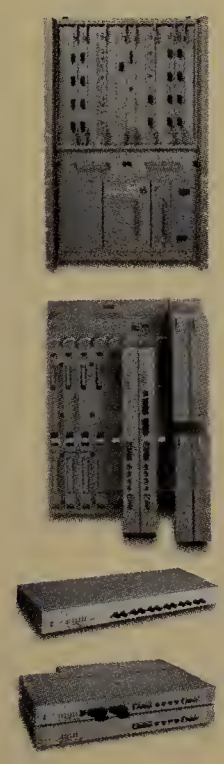
In networking, "and" is a vastly more powerful notion than "or." Which is why DIGITAL offers a comprehensive family

We only build switches for the really important network technologies.

Namely, all of them.

of price/performance leading switches, for every technology.

You're into **Ethernet** and **Fast Ethernet**? DIGITAL has them.



DIGITAL switches are equally at home in stand-alone, rack-mount or chassis configurations.

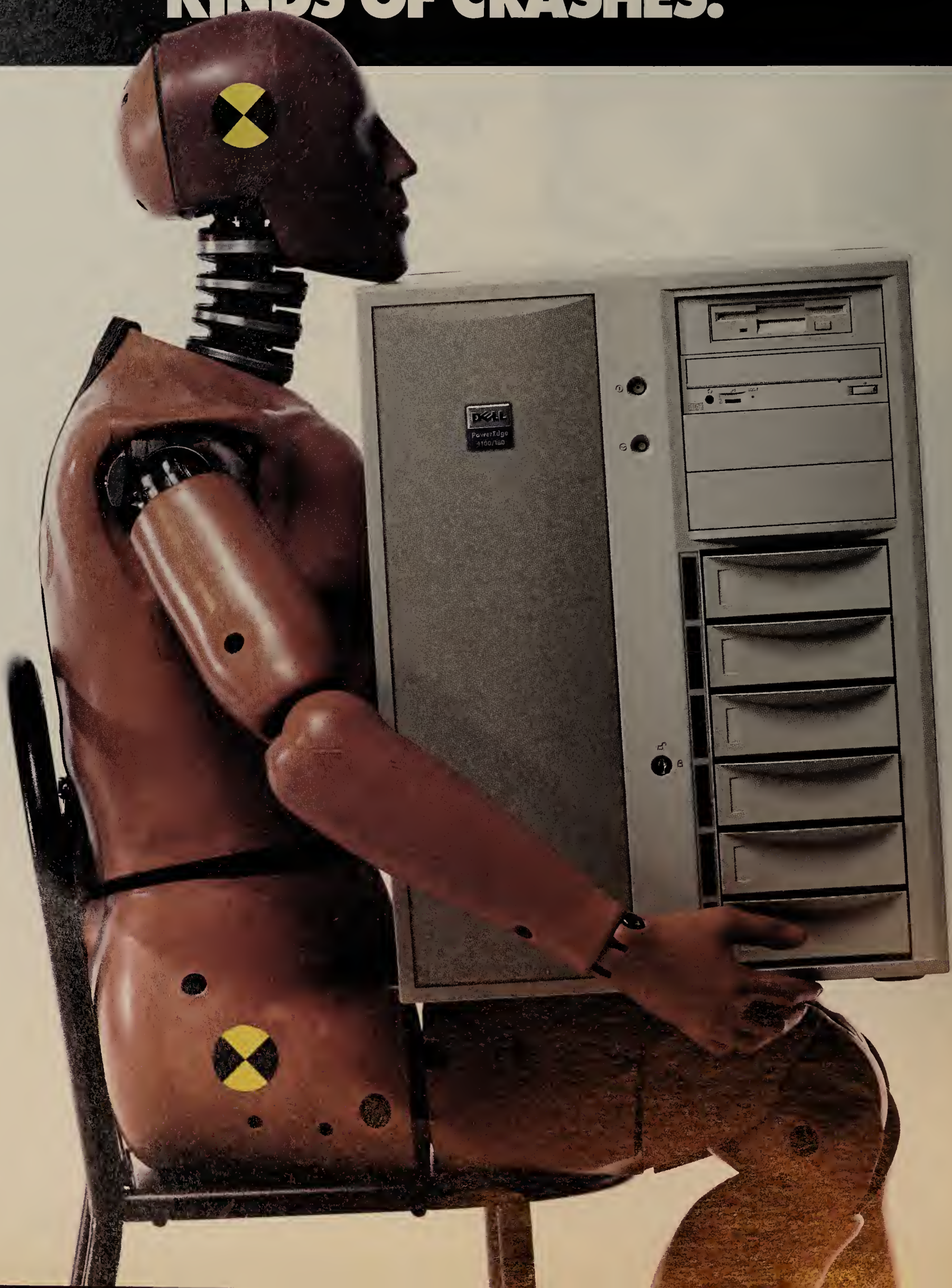
Thinking ahead to **Gigabit Ethernet**? So is DIGITAL. Need secure, high-speed Internet access? We make the world's fastest **FDDI** and **IP** switches. Moving to **ATM**? DIGITAL's already there. Every DIGITAL switch is flexible, modular, scalable from desktop to enterprise. And backed by DIGITAL's worldwide service and support. See your DIGITAL Business Partner, call **1-800-457-8211**, or visit **www.networks.digital.com**, for switches designed around the most powerful technology of all: the power of choice.

digital™

Whatever it takes.℠

*Circle Reader Service #**26***

PRESENTING THE FIRST SERVER THAT PROTECTS YOU AGAINST ALL KINDS OF CRASHES.



intel inside
PENTIUM PRO PROCESSOR

INCLUDING COLLISIONS WITH THE ACCOUNTING DEPARTMENT.

INTRODUCING THE DELL® POWEREDGE® 4100 — REDEFINING THE MID-RANGE SERVER.

The way we build servers, reliability isn't an option, it's a mandate. Which is why on the new PowerEdge 4100 there are a host of high-end safety features that come standard. Like 3 fans and 2 power supplies. ECC to catch and correct 1-bit errors, and RAID that stores data on multiple disks. The ability to hot swap hard drives without shutting down the machine and without interrupting your network. Even a feature called Remote Assistant that operates independently of the system, dialing out to notify you in the event of a failure and letting you dial back in to address the problem. Something you'd normally have to pay extra for. So protect your network with a Dell server. And protect yourself from the price gouging of the server status quo.

MID-RANGE SERVERS

DELL® POWEREDGE® 4100 SERVER
200MHz PENTIUM® PRO PROCESSOR
(Dual Processor Capable)

- 128MB Error Correcting Code (ECC) EDO Memory (1GB Max.)
- 512KB Integrated L2 Cache
- 2 Integrated SCSI-3 Controllers: -1 Ultra/Wide SCSI for HDD's; -1 Ultra/Narrow SCSI for CD-ROM
- 4GB Ultra/Wide SCSI-3 Hard Drive (54GB Max. Internal)
- 8X SCSI CD-ROM Drive
- Intel® EtherExpress™ Pro/100 PCI NIC
- Intel LANDesk® Server Manager v2.5
- 8 Expansion Slots: 5 PCI, 3 EISA
- 10 Externally Accessible Drive Bays
- 3 Year Limited Warranty† with 1 Year NBD On-site$^{\Delta}$ Service
- 24x7 Dedicated Server Hardware Technical Support

★ ***Add Microsoft NT® Server 4.0 for $799.***

$6649‡

Business Lease$^{\Diamond}$: $240/Mo.
Order Code: #200160

DELL POWEREDGE 4100 SERVER
180MHz PENTIUM PRO PROCESSOR
(Dual Processor Capable)

- 64MB Error Correcting Code (ECC) EDO Memory (1GB Max.)
- 256KB Integrated L2 Cache
- 2 Integrated SCSI-3 Controllers: -1 Ultra/Wide SCSI for HDD's; -1 Ultra/Narrow SCSI for CD-ROM
- 4GB Ultra/Wide SCSI-3 Hard Drive (54GB Max. Internal)
- 8X SCSI CD-ROM Drive
- Intel EtherExpress Pro/100 PCI NIC
- Intel LANDesk Server Manager v2.5
- 8 Expansion Slots: 5 PCI, 3 EISA
- 10 Externally Accessible Drive Bays
- 3 Year Limited Warranty† with 1 Year NBD On-site$^{\Delta}$ Service
- 24x7 Dedicated Server Hardware Technical Support

★ ***Add Microsoft NT Server 4.0 for $799.***

$5399

Business Lease: $195/Mo.
Order Code: #200158

ENTRY LEVEL SERVERS

DELL POWEREDGE 2100 SERVER
200MHz PENTIUM PRO PROCESSOR

- 64MB Error Correcting Code (ECC) EDO Memory (256MB Max.)
- 256KB Integrated L2 Cache
- Integrated PCI Ultra/Wide SCSI-3 Controller
- 4GB Ultra/Wide SCSI-3 Hard Drive [7200RPM, 8ms] (12GB Max.)
- 8X SCSI CD-ROM Drive
- 3Com® 3C595 10/100 PCI Network Adapter
- Intel LANDesk Server Manager v2.5
- 6 Expansion Slots: 3 PCI, 3 EISA
- 6 Drive Bays: 3 Internal 3.5"/ 3 External 5.25"
- 3 Year Limited Warranty† with 1 Year NBD On-site$^{\Delta}$ Service
- 24x7 Dedicated Server Hardware Technical Support

★ ***Add Microsoft NT Server 4.0 for $799.***

$3219

Business Lease: $120/Mo.
Order Code: #250014

DELL POWEREDGE 2100 SERVER
180MHz PENTIUM PRO PROCESSOR

- 32MB Error Correcting Code (ECC) EDO Memory (256MB Max.)
- 256KB Integrated L2 Cache
- Integrated PCI Ultra/Wide SCSI-3 Controller
- 2GB Ultra/Wide SCSI-3 Hard Drive [7200RPM, 8ms] (12GB Max.)
- 8X SCSI CD-ROM Drive
- 3Com 3C595 10/100 PCI Network Adapter
- Intel LANDesk Server Manager v2.5
- 6 Expansion Slots: 3 PCI, 3 EISA
- 6 Drive Bays: 3 Internal 3.5"/ 3 External 5.25"
- 3 Year Limited Warranty† with 1 Year NBD On-site$^{\Delta}$ Service
- 24x7 Dedicated Server Hardware Technical Support

★ ***Add Microsoft NT Server 4.0 for $799.***

$2639

Business Lease: $98/Mo.
Order Code: #200143

DELL®

888-346-2285

http://www.dell.com

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm
In Canada: call 800-839-0148
In Latin America: call 512-728-4685
GSA Contract #GS-35F-4076D

Keycode #29040

‡Non-discountable promotional prices. †For a complete copy of our Guarantees or Limited Warranties, please write Dell USA L.P., One Dell Way, Round Rock, TX 78682. $^{\Delta}$This on-site parts and labor service provided by independent third party service providers and may not be available in certain remote locations. $^{\Diamond}$Business leasing arranged by third party leasing companies. ★Prices and specifications valid in the U.S. only and subject to change without notice. Intel, the Intel Inside Pentium Pro logo, Pentium and LANDesk are registered trademarks and EtherExpress is a trademark of Intel Corporation. MS, Microsoft, and NT are registered trademarks of Microsoft Corporation. 3Com is a registered trademark of 3Com Corporation. Dell, the Dell logo and PowerEdge are registered trademarks of Dell Computer Corp.

Oracle

Continued from page 1

oriented and electronic commerce systems. In announcing its strategy, Oracle is following on the heels of Sybase, Inc. and Microsoft Corp., which also plan to deliver distributed messaging technologies.

"The idea is to guarantee delivery of transactions [via reliable message queues] over the network to the database," said Richard Finkelstein, president of Performance Computing, Inc., a Chicago consulting company. "Messaging products of this type give you a higher level of security and load balancing in distributed systems and give you a greater degree of control over them."

This approach, often called asynchronous messaging, fits well with the nature of Web applications, which may involve interactions among multiple systems. A user can submit a transaction from a browser and disconnect, while the message queues ensure it reaches the database and trigger actions in other databases and applications.

"In these kinds of environments, at some point asynchronous messaging becomes increasingly important, not just server to server, but business to business," said Kelly Herrell, senior director of marketing for Oracle's server technologies group.

Oracle's arch-rival Sybase said recently that the Gryphon release of its Sybase SQL Server, due out late this year, also will have a message queuing system.

"What this really is is event management," said Don Depalma, senior analyst at Forrester Research, Inc., in Cambridge, Mass. The database creates a transaction or registers a change. It then notifies, via a message, other systems and applications about what has happened, so they in turn can respond.

One example of the impact of messaging, Depalma said, is that trading applications used by stock brokers watching IBM's price would be notified automatically of any price change, instead of having to query the database over the network every 60 seconds.

In fact, Depalma predicts the traditional message-oriented middleware products will blend with newer "information push" or publish/subscribe products, which send or publish information to applications that register interest in or subscribe to that information.

By making use of MQSeries, Oracle can move into message-based applications among corporate customers, according to Depalma. MQSeries is the dominant messaging middleware product today, and Oracle8 will exploit a wealth of existing interfaces to diverse systems.

In the future, via a bridge product from Level 8 Systems Inc., the database can work with Microsoft's Falcon messaging server, now in beta test.

Without going into details, Herrell said Oracle's distributed messaging will have an extensive array of security features, including encryption and public keys. "That's important," Depalma said. "You want to make sure that when something comes across the line, no one has mucked with it." Depalma speculated that Oracle will rely on Level 8's products, which include software for MQSeries security.

© Oracle: (415) 506-7000.

Satellites

Continued from page 12

blew up. The next rocket is expected to take off in May. Although no satellites are in place right now, Iridium still said services will be available in September of next year.

Kirkland, Wash.-based Teledesic is taking a route similar to Iridium's, except its focus is on the fixed broadband data market.

The $9 billion joint venture between Craig McCaw and Bill Gates received the Ka-band license, which it got earlier this month.

This will allow Teledesic to offer fixed wireless broadband data services to potential users over the 840 satellites it plans on launching by the year 2002.

Iridium's service will be based on a phone the size of a typical cellular phone and will cost $3,000.

The service charge is no bargain either at $3 per minute. Other companies such as Globalstar Telecommunications, Ltd. and Odyssey Telecommunications International, Inc. are planning to offer services that are a little more economical but not inexpensive — $1,000 for the phone and $1 per minute for service, said David Cooperstein, an analyst at Forrester Research, Inc., a Cambridge, Mass.-based consultancy. ■

IP

Continued from page 1

change or add applications quickly," says Mike Truman, internal consultant with the Oregon Department of Corrections. "Looking down the road five years, we think the world is going to be more IP-based than it is today, and we want to be able to take advantage of that."

"The protocol battle is over and TCP/IP won," according to Phil Emer, assistant director for network technology development at North Carolina State University in Raleigh, N.C., The university has laid down the law in its multiyear project to build a new backbone: Users can have what they want out from the wiring closet, but the backbone is all IP.

"A single protocol backbone is the most efficient and easy-to-manage environment," Emer says.

While all the IP hoopla of late may have you thinking otherwise, the idea of IP-only backbones is only now beginning to garner favor with corporate America. In fact, according to research by the CIMI Corp. consultancy in Voorhees, N.J., only about 2% of today's businesses have such environments. But that is slowly changing.

The skinny on TCP/IP

- **In North America, 46% of IS managers use TCP/IP as their primary network backbone — Datamation/Cowen & Co.**
- **In early 1996, TCP/IP surpassed IPX as the LAN transport protocol of choice to the desktop — Business Research Group.**
- **Researchers expect that 64% of all networks will be linked with TCP/IP by 1998 — Dataquest.**

Users exploring the IP-only alternative cite as benefits the protocol's ubiquity, the chance to employ standardized SNMP-based platforms and the ease of management that comes with reducing complexity.

"Because we anticipate a number of new online TCP/IP-based applications in the next few years, we knew we needed TCP/IP's flexibility for hardware and software," says Joe Earhart, senior analyst with Carolina Power & Light Co. in Raleigh. "We have a requirement to support distributed business applications today and allow for the migration to ATM, and we feel this is the correct path."

Carolina Power is about halfway through a network revamp that ultimately will result in an IP-only, ATM-based backbone.

Along the way, these three users have learned that while IP may represent network nirvana, the path to that enlightenment has a few bumps, the most obvious and largest being how to deal with legacy data.

"DNS was hard-coded in a number of systems, making them very inflexible, so a lot of preplanning was required before we moved or changed those systems," Earhart says.

In all three cases, SNA traffic, while being phased out, is still traversing the new TCP/IP backbone. North Carolina supports its SNA traffic using Data Link Switching, an industry standard for encapsulating SNA data in TCP/IP wrappers. Oregon uses Microsoft Corp.'s SNA Server and tn3270 packages to allow 3270 access to host resources.

With tn3270, clients can access SNA applications over a TCP/IP backbone by converting SNA protocols into TCP/IP telnet sessions.

"More and more users want an IP-only environment, but they can't escape their investment in legacy equipment," says Anura Guruge, an independent analyst based in New Ipswich, N.H. "This is why SNA gateways, browser-based SNA conversion and other migration tools will become integral parts of IP-only environments."

Lessons learned

"We were strictly SNA in the past, so we've had to go through a big education process to get everyone to the IP environment — it's a big culture shift that we've been largely successful with," Oregon's Truman says. "It's also a slow process, so don't think things will be done overnight."

Others cite the need to become experts in configuring tn3270 gateways that tend to proliferate in a mixed SNA and TCP/IP environment. Security concerns also accelerate.

"Security is an issue we never had to worry much about with SNA; now it is a primary concern," Truman says. "Now everyone has access to everything, and the system is exposed to the outside world." SNA was pretty much a closed system guarded by IBM's Resource Access Control Facility, making it one of the most secure nets possible, he says.

"There are more PCs, rather than dumb terminals, so configuring those boxes is an issue — it takes more time and support to handle administration of the IP environment," Truman says.

Properly configuring the Domain Naming System (DNS) was the biggest nightmare, according to Carolina Power's Earhart. DNS is the service within TCP/IP that tracks host names and Internet addresses.

"DNS was hard-coded in a number of systems, making them very inflexible, so a lot of preplanning was required before we moved or changed those systems," Earhart says.

The utility overcame this limitation by subnetting the hard-coded devices and making sure the devices do not move around a lot.

According to Earhart, one emerging technology that has helped is the Dynamic Host Configuration Protocol (DHCP), which automatically assigns IP addresses, configurations and security for any devices being added to or moved around a TCP/IP-based enterprise. DHCP is the Internet Engineering Task Force standard that defines how IP devices automatically register with a server in a TCP/IP environment.

Addressing is almost always an issue when it comes to large-scale IP implementations, says CIMI President Thomas Nolle. "If not handled correctly, and that's no easy task, IP addressing can bring a network to its knees," he says.

Some users make the mistake of thinking they can handle TCP/IP in the same way they have handled other protocols such as IPX/SPX or AppleTalk, North Carolina State's Emer says. "That's a big mistake because network design, addressing and TCP/IP subnetting require a much more centralized approach than those localized protocols did."

Making sure multivendor TCP/IP stacks can, in fact, communicate is also something to watch out for, Earhart maintains. "There are a lot of client stacks out there and not all of them work well together," he says.

In the end, most users say building an IP-only environment is worth the effort.

"It's a slow process, but we feel that we went from a Volkswagen to a Cadillac with the new IP net," Earhart says. ■

Yes!

Please send me a free copy of the
Madge Networks Solutions Guide and the
MadgeOne™ CD on Multiservice Networking.

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

PHONE _____ FAX _____

EMAIL _____

MADGE

NW3/24

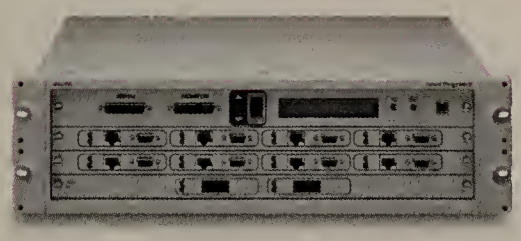
NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 1410 SAN JOSE CA

POSTAGE WILL BE PAID BY ADDRESSEE

Madge Networks
2310 North First Street
San Jose CA 95131-9770

truly token ring.



At Madge Networks, we can fulfill your Token Ring wish list: more speed, more bandwidth, easier management, and all at an affordable price.

The award-winning Smart Ringswitch™ builds on your existing network infrastructure while offering the immediate benefits of cut-through switching, the doubling of server throughput and the ability to upgrade your network to ATM whenever you're ready.

With Smart Ringswitch and Madge's leading-edge Token Ring adapter cards you can build the optimal, cost-effective, Token Ring network.

And with our industry-recognized switching expertise in Token Ring, Ethernet, ATM and ISDN, Madge Networks is setting the agenda for the networks of the future. So stop wishing, and call Madge today.

FREE

The *Madge Networks Solutions Guide* is a step-by-step book on building high performance, flexible, resilient networks. For your free copy, PLUS a MadgeOne™ CD on Multiservice Networking, call 800-876-2343, or fax us your business card on 408-952-9893.

Madge Networks, 2310 North First Street, San Jose, CA 95131-1011.
http://www.madge.com
A7003

Madge Networks – truly transforming solutions.

MADGE

10 Mbps to the desktop sounds great.

Until you need 11 Mbps, that is.

SMC TigerStack 100 Fast Ethernet stackable hubs.

Let's face facts. A few users simultaneously accessing standard office applications can drain all the bandwidth in a 10 Mbps network. Combine that with today's client/server, Internet access, and imaging applications, and 10 Mbps to the desktop won't hold water for very long.

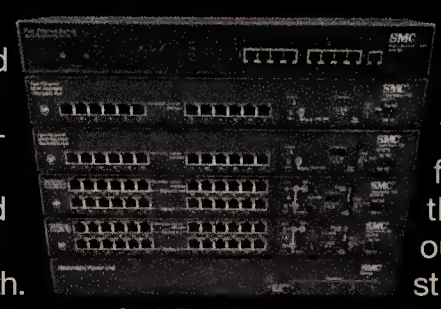
Fortunately, SMC has a better way to quench your thirst for bandwidth: SwitchReady™ TigerStack™ 100 Fast Ethernet stackable hubs.

With the TigerStack 100, you can implement a shared 100 Mbps network today, add Fast Ethernet switching whenever you need, and build a solid foundation for long-term growth.

The TigerStack 100 also makes it easy to integrate 100 Mbps technology with your 10 Mbps LAN—improving response time for *all* network users.

And with multi-segment management (SNMP and RMON), as well as the industry's strongest Customer Satisfaction Guarantee, the TigerStack 100 offers all the reliability you need. Not to mention a per-port price that's easy to swallow.

So if you're looking for a bandwidth solution with capacity for the future, look to the TigerStack 100 from SMC. We think you'll find our Fast Ethernet strategy watertight.



SMC TigerStack 100

SMC®

Connect With Us.

For information on SMC products call 1-800-SMC-4-YOU, Dept. WG06

http://www.smc.com

For your free SMC "Practical Guide to LAN Switching and Fast Ethernet Integration," call us or visit our Web site today.

Circle Reader Service #21

Briefs

■ **Eicon Technology Corp.** *this week will announce a new* **WAN board for Windows NT Servers** *that incorporates a frame relay access device (FRAD). The Frame Relay Link Service board and its controlling software allows the NT Server and its SNA Server component to support SNA traffic over a frame relay net, remote access routing services and gateway support without the need for an external FRAD or router.*

Tremblay

According to Michel Tremblay, Eicon's Microsoft business unit manager, the board can support up to two ports of T-1-speed frame relay.

The board is available for prices starting at $1,095.

✆ Eicon: (524) 745-5500.

■ **Wall Data Inc.** *has introduced Arpeggio Live software that will let users pull data from IBM mainframe and Application System/400 midrange applications and make it available to any industry-standard Internet browser. Arpeggio converts database or SNA communications flows into HTML.*

The package runs on Windows NT servers and supports the ActiveX development environment. Arpeggio Live is available for $1,495.

✆ Wall Data: (800) 915-9255.

■ **Symantec Corp.** *announced shipment of* **Expose 4.0,** *a server management product that allows administrators to manage PC LAN-based servers through the Internet from a standard Web browser. Expose 4.0 provides performance management of Windows NT-based Web servers.*

The software also provides real-time server status and can be customized to include or exclude server parameters. In addition, it provides single- and cross-device reporting.

Expose 4.0 is available now for $695 per server.

✆ Symantec: (541) 334-6054.

Psst . . . IBM's got a deal for you

Company looks to move network sales out of the boardroom and onto the street.

By Michael Cooney
Raleigh, N.C.

IBM is taking its networking products to the street.

The Networking Hardware Division (NHD) this year will roll out a plan that increases the role third-party business partners play in selling routers, hubs, frame relay access devices and other networking gear, and reduces the dependency the division now has on its direct sales force.

The move means users will be offered more packaged products and could see products installed faster.

More specifically, IBM is expected to start selling more servers, hubs, routers and other networking gear as one bundle. Today, most of IBM's networking and server gear is sold by different parts of the IBM sales force and, consequently, can force users into more of a systems integration role than most care for.

Large integrators such as Anixter, Inc. and Centron DPL Co. resell IBM packaged equipment, but it is not the general way IBM networking gear is sold, observers said.

IBM's *Hahne wants to exploit the company's successful PC Co. sales channel to increase networking gear sales.*

"We have a huge, successful sales channel in our PC business, and we will exploit that for selling networking products," said Lutze Hahne, general manager of the NHD.

A little help from my friends

Lee Roberts, general manager and vice president of worldwide marketing and sales for the division, took that sentiment a bit further. "What we'd like to see is some 70% of our networking goods and services coming through business partners," he said.

Roberts said IBM will implement a comprehensive business partner plan by geographical regions by the end of the year. The plan will include training and consulting services business partners can use to build large enterprise infrastructures.

NHD executives also pointed out that the company has already begun making substantial shifts in the way it sells products. For example, at its recent Business Partner Executive Conference meeting in Miami, Fla., IBM noted these facts:

- In 1996, 48% of IBM's revenue from small and midsize enterprises was earned in association with business partners.
- IBM provided leads to business partners that generated an estimated $920 million.
- IBM subcontracted more than $1 billion of systems integration work to professional services providers.

In addition, IBM last week announced that resellers can buy networking products from IBM through another large business partner, Globelle, on its Government Services Administration schedule. Globelle is a wholesale distributor of microcomputer products that specializes in networking, connectivity and data communications packaging.

"Users have the option of dealing with the direct sales force or a business partner, whoever they feel more comfortable with," Roberts said. "It's a big market, and we want to hit every space we can." ■

High-speed access

Motorola exterminates 56K modem-speed bug

By Tim Greene

Don't look for Motorola, Inc. 56K modems on your computer dealers' shelves just yet.

The vendor yanked the product while its modem partner, Rockwell Technologies, tries to stop the modems from slowing down on certain phone lines. Rockwell says it has a fix, but the modems will still be off the market for at least another week.

Rockwell indicated the problem cuts off 10% to 15% from optimum speed for the modems. It is linked to certain telephone line cards, which are the physical analog interfaces on a telephone switch that connect to the wires that lead to customer homes.

While both companies said the problem is correctable, pulling the modems out of distribution gives potential buyers the sense that perhaps the technology is being rushed to market before it is ready.

The problem and its correction could also be the first indication of potential performance differences between Rockwell-supported 56K bit/sec modems and those manufactured by U.S. Robotics. Until now, both camps had acknowledged that, depending on unspecified line conditions, tranmission speed could be less than optimum.

Now Rockwell is saying that it has found a way to get around a specific problem presented by carrier networks. Because Rockwell is being secretive about it, it is unclear whether the company has solved this problem and U.S. Robotics has not or whether Rockwell is playing catch-up.

Motorola said the problem causes the modems to lose 5K bit/sec to 10K bit/sec under certain line conditions. The top speed already falls 3K to 4K bit/sec short of 56K bit/sec because the modems need more power than federal regulations allow.

The identified problems affect only the ROM-based customer-end modem and cropped up during field tests. Motorola found that lines in California, for instance, delivered higher performance on average than lines in Virginia. A spokeswoman for Rockwell said that could be because the lines in Virginia and the East in general are older than those in the West.

A spokesman for Microcom, Inc., another vendor using the Rockwell technology, said the problem involved packet assembler-disassemblers (PAD) in telephone networks. The PADs were made by a specific vendor after a specific date, he said, but he did not know the details.

Motorola and Rockwell said they would not reveal the exact cause of the problems or the fix for competitive reasons.

Your speed may vary

Both U.S. Robotics and Rockwell 56K bit/sec modem technologies approach full speed only when downloading from a modem connected to the telephone network over a digital line.

Lucent Technologies, Inc., which supports the same 56K bit/sec modem technology as Rockwell using Lucent chips, refused to say whether its testing revealed similar problems.

U.S. Robotics said they did not know whether its modems could overcome the network conditions that hampered Rockwell because Rockwell would not reveal exactly what they were.

Meanwhile, the Open 56K Forum, an alliance of modem vendors and service providers that use the Rockwell/Lucent technology, has canceled its first meeting. The forum was supposed to share interoperability information. The reworking of the Rockwell chips means a delay of interoperability tests. ■

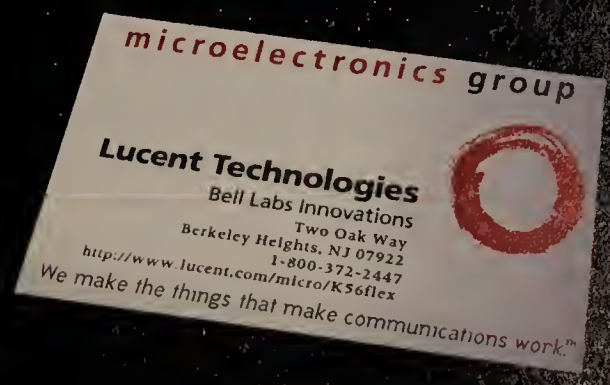
THREE. FOR ALL.

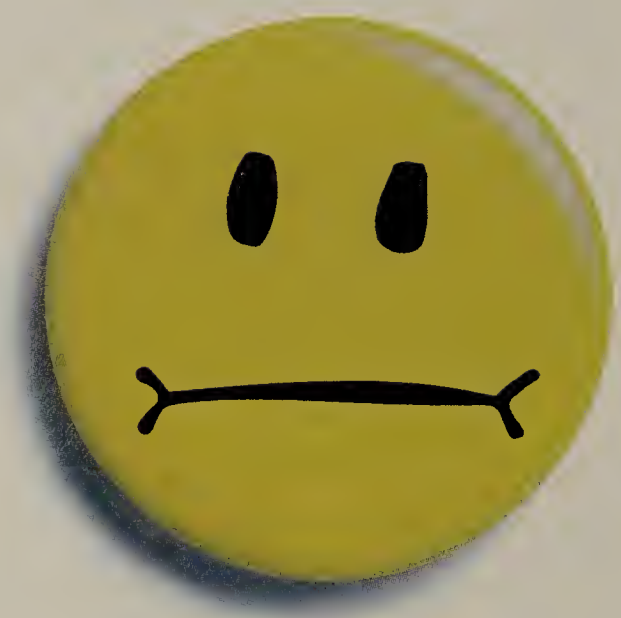
Our K56flex™ modem chip set enables the most widely supported 56K technology in the industry.

K56flex. The new modem technology from the company that invented the transistor.

Over 400 leading high-tech companies— including Compaq, Fujitsu, Hayes, Hewlett-Packard, Livingston Enterprises, Inc., Multi-Tech Systems, PSINet, Toshiba, and Xircom — are getting behind our new interoperable K56flex modem technology. Pioneered by Bell Labs, this exciting technology works over existing phone lines and lets you surf the internet up to twice as fast as most modems.

Modems using Lucent's K56flex chips are software upgradeable, so it will be easy to keep up with any emerging standards. Plus, our chip set is backward compatible, ensuring interoperability with both new and existing technologies. For more information about all the PC companies, modem manufacturers and ISPs who are adopting K56flex technology, check our web site or call 1-800-372-2447 (Ext. 949).





BEFORE.

AFTER.

"If you think winning awards makes us happy, you should see what these services do for our clients moods."

—Bruce Bond, President and CEO, ANS Communications

Our Virtual Private Data Networks and our Web Hosting Services are being acclaimed as the leaders in the industry. Frankly, we are honored, but not exactly surprised. ANS was the first to offer guarantees for these services. And ANS continues to be the premiere provider of secure, reliable Internet and Intranet services to business. We ensure that our system is up and running so our clients can concentrate on "Having a nice day". Call **800-456-8267**, e-mail us at **info@ans.net** or visit our Website at **www.ans.net.**

HAPPILY EVER AFTER

ans
AN AMERICA ONLINE COMPANY

Carrier Services

Covering: Local and Long-Distance Services • Value-Added Networks • Cable, Satellite and Wireless Networks • Regulatory Affairs • Carrier-Based Internet Services

Briefs

■ **Lucent Technologies, Inc.** *earlier this month agreed to something that would have been unthinkable when it was part of AT&T: allowing a regional Bell operating company be its* **equipment distributor.**

Lucent signed up SBC Communications, Inc. to sell its

PBXs, messaging products, call center gear and network management services to large and midsize businesses. Lucent displaces Northern Telecom, Inc. as SBC's preferred supplier.

While they are not giving the service away for free, **Bell Atlantic** *is trying harder to sell ISDN by dropping the installation charge. It is also giving a discount on ISDN terminal adapters as part of an offer that runs through the end of April.*

■ *Two members of the California Public Utilities Commission have proposed that* **Pacific Telesis Group** *and* **SBC Communications, Inc. (SBC)** *pay $330 million to California phone users as the customer share of PacTel's profits from the merger. That is down from the $750 million proposed by an administrative law judge. SBC and PacTel both said $750 million would break the deal.*

In New York state the proposed merger of NYNEX Corp. and Bell Atlantic Corp. is getting heat from regulators. The Public Services Commission has threatened to apply restrictions that could boost the cost of the deal by as much as $1 billion. State regulators in California and New York are weighing the details.

■ *For those with wide-area broadband needs,* **Teleport Communications Group, Inc.** *(TCG) last week introduced the first nationwide* **OC-12 ATM** *service, making 655M bit/sec available in the 14 cities where TCG offers ATM services. The company expects the service to generate interest in the health care and entertainment industries.*

Canadian carrier woos U.S. end users

By David Rohde
New York

If 9.9 cents-per-minute voice and fax calling to the U.K. beats any other option you have to reach the British Isles, then a Canadian carrier wants to talk to you.

This month, Teleglobe International Corp. launched the promotional rate from the New York area to herald its entry into the U.S. end-user market.

Teleglobe is using the 9.9-cent deal as a lead-in to sales of international direct-dial and private-line services to large U.S. businesses, said Paolo Guidi, the company's president. Teleglobe also plans to eventually carry U.S. businesses' toll-free traffic originating in foreign countries, Guidi said.

The company is a subsidiary of Montreal-based Teleglobe, Inc., the principal carrier of international calls originating in Canada. Teleglobe is also known as a wholesale carrier for global public-switched and Internet traffic. But until now, the company has not served end users outside Canada.

Teleglobe hopes to take advantage of its large direct ownership of international transmission facilities to offer rates below those typically charged for international direct dial (see graphic).

Teleglobe's introductory rate easily beats the 25-to-30-cent effective rate to the U.K. obtainable on discount contracts with large U.S.-based carriers, said Leonard Elfenbein, president of Lynx Technologies, Inc., an international telecommunications consultancy and network integrator in Fairfield, N.J. Elfenbein cautioned that dedicated or dial-up access to Teleglobe's New York or other switching centers could push its effective rate to 16 to 18 cents per minute.

And since the Teleglobe traffic cannot be included on the major U.S. carriers' advanced billing systems delivered via CD-ROM, "for some users, it may not be worth a few cents' savings," he said.

Indeed, Teleglobe officials make no pretense the company's services are anything more than a cut-rate deal or that it is looking to capture the bulk of individual users' traffic. The carrier is not offering any virtual private network routing features, packet-data WAN services or volume discounts on large contracts.

The carrier is not offering any virtual private network routing features, packet-data WAN services or volume discounts on large contracts.

Instead, it will ask customers to use the automatic rout selection features on their PBXs and other call-routing techniques to slice their off-net traffic away from their principal carrier and send it via Teleglobe. Off-net destinations frequently account for 90% or more of users' international voice and fax traffic, Guidi said.

Teleglobe's cut-rate offer will also compete against new carrier offerings that skirt the international public-switched network entirely by sending messaging traffic — such as faxes users can accept in a store-and-forward mode — over private data networks or the Internet. Guidi is confident that international fax users will prefer a circuit-switched dial-up connection at a reasonable rate. "Most people prefer to send faxes in real time," he said.

✆ Teleglobe: (703) 714-6600.

Trans-Atlantic power

Here's a quick look at Teleglobe International's facilities.

Facilities-based licenses in:
the U.S., the U.K. and Germany

International switching centers:
Montreal, Toronto, Vancouver, New York and London

Principal owner:
Globesystem Atlantic undersea cable system

Co-owner:
Intelsat and Inmarsat satellites

Teleglobe International also owns capacity in all major North American transcontinental fiber-optic cable systems.

SOURCE: TELEGLOBE INTERNATIONAL, MCLEAN, VA.

'Net access, DSL style

UUNET offers IDSL service with 128K bit/sec access.

By Denise Pappalardo

UUNET Technologies, a subsidiary of WorldCom, Inc., has announced a rollout schedule and pricing plans for its Preferred Access 128 Digital Subscriber Line (DSL) service.

The service will let users access UUNET's network at 128K bit/sec. ISDN DSL (IDSL) should be easier for users seeking to adopt fast access. With IDSL, end users can simply deploy an ISDN router instead of new DSL equipment, with which they may not be as familiar.

Vidal says UUNET *leverages unbundled copper loops in 22 states where WorldCom has signed interconnection agreements.*

IDSL runs over traditional copper wire from local exchange carriers' (LEC) central office switch sites. UUNET is able to provision the service because parent company WorldCom inked interconnection agreements with LECs in 22 states, said Ron Vidal, vice president of new ventures at WorldCom.

"The Telecommunications Act said that the incumbent LECs had to unbundle their copper loops, making them available to companies like us," Vidal said.

Based on these agreements, UUNET deployed Ascend Communications, Inc. communications servers in central office switch sites in California, where the Internet service provider will first offer service. Even though the telecom legislation is tied up in the courts, Vidal said that will not hinder the agreements the company has already made with other telephone companies.

Users will have to pay local-loop access charges of $150 to $255 per month, depending on the city in which they are based. Internet access services will be available for $650 to $750 per month, depending on term contracts.

The ISDN router needed to support UUNET's services is available through UUNET or Ascend for $750.

"Users are not going to find dedicated access [service rates] for much less than what UUNET is offering here," said Joel Maloff, president of Maloff Co., a Dexter, Mich.-based consulting firm.

Earlier this year US WEST, Inc. announced IDSL-based service in its region. The LEC said its prices will be determined on a case-by-case basis, but would most likely range from $75 to $175 per month for access fees. That price does not include Internet access.

InterAccess, Inc., a regional ISP based in Chicago, is offering an Asymmetric DSL service (ADSL).

The LAN-to-ADSL business service is available in the Chicago area for at least $1,000 per month with a one-time installation fee of at least $1,000. Users pay extra for E-mail accounts and additional newsgroups.

The ADSL device necessary to support the service at the user's site is $1,500, or users can rent it for $117 per month.

UUNET has started rolling out service in Northern California, with service due to hit San Jose, Milpitas, Santa Clara, Palo Alto, Sunnyvale and Mountain View by the end of the month.

By the end of the second quarter, the company expects to provide service in 25 cities. UUNET will deploy service in 92 additional cities by the end of the third quarter.

Users will also have the option of upgrading to UUNET's Preferred Access 768 services by the end of the second quarter. The Preferred Access 768 services are based on High-bit-rate DSL (HDSL) technology.

The service will require users to install a new router from Ascend or another vendor that supports HDSL. US WEST, Inc. also plans to offer an HDSL-based service.

✆ UUNET: (703) 206-5600.

Managed Access Solutions from GDC

INTELLIGENCE RUNS IN THE FAMILY

INTRODUCING THE METROPLEX 6000 FROM GDC. The next generation of intelligent T-1 access multiplexers. How advanced is GDC's Metroplex 6000? Let's just say it's in a class of its own. Metroplex 6000 creates significant savings on your access costs by integrating multiple voice and data lines onto a more cost-effective T-1 line. You save money in other ways too: the unique modular design of Metroplex 6000 has a low initial cost for smaller installations, yet easily expands to support two T-1 lines when needed. So customers can start small and upgrade as their business expands. And Metroplex 6000 is easy to install and use, with simple menu-driven management or a full SNMP/HP OpenView interface. It's the intelligent solution that's seamlessly compatible with GDC's entire class of managed access solutions. See why leading companies have already placed GDC's Metroplex 6000 at the head of the class. And why you should, too. To learn more, call us at 1-800-SWITCH-ON today and ask for a free copy of our Metroplex 6000 Application Guide.

General DataComm

Call 1-800-SWITCH-ON
http://www.gdc.com

Right for Today. Ready for Tomorrow.

Circle Reader Service #28

WAN MONITOR

Baking cookies, buying networks

A good friend of ours, Steven Taylor, forwarded a funny tidbit he found on the Internet. It's called "Why Engineers Don't Write Recipe Books" and shows how an engineer would write a recipe for chocolate chip cookies.

Ingredients:

532.35 cm3 gluten

4.9 cm NaHCO3

236.6 cm partially hydrogenated tallow triglyceride

177.45 cm3 crystalline C12H22011

4.8cm3 mythyl ether of protocatechuic aldehyde, etc.

Now for the exciting part — making the cookie dough:

Daniel Briere and Christine Heckart

To a 2-L jacketed round reactor vessel with an overall heat transfer coefficient of 100 Btw/F-ft2-hr, add ingredients one, two and three with constant agitation. In a second 2-L reactor vessel with a radial flow impeller operating at 100rpm, add additional ingredients until homogeneous, etc.

Yes, this is funny (the entire recipe can be found at www.telechoice.com). Unfortunately, you may feel it is representative of how network suppliers talk every day.

Here is a similar ingredients list for networking with ATM:

1 VBR-RT PVC where PCR=1.17M bit/sec, SCR=768K bit/sec, MaxCLR=10^{-8}, CDVT=1 msec and MBS=500 cells

2 ABR SVC where PCR=34M bit/sec, MCR=1M bit/sec, MaxCLR=10^{-9} and CDVT=1 msec

4 UBR SVC where anything goes!

In our *ATM For Dummies* book (IDG Books Worldwide), we concluded that there is a secret ATM club you have to join to understand the real meaning of all the acronyms and buzzwords.

Why can't service providers — and equipment vendors, for that matter — package all this technology into terminology that is understandable and usable? Why can't there just be such things as a LAN connection for IP, or IPX, or a combination of protocols? Why can't there be an SNA connection? A voice connection? And so forth.

If we have to get fancy, then offer three levels of the LAN, SNA or voice connection such as high, medium and low (that is, expensive, cost-effective and really cheap).

Why does everything in this industry have to be so technical? So complicated?

One reason is most of the insiders are technocrats. We get really excited about all this great technology and love the bits, bytes and outlandish acronyms. And we get so used to all the technobabble that we forget a normal person may not spend their whole lives just keeping up with the latest evolution of the standards.

But you can help us help you. Forget the technical questions. Forget about the bits and bytes. Force service providers to commit to a service level agreement with penalties for nonperformance. Have them package the equipment with the service so they have total quality control.

Frankly, it doesn't matter if they use ATM or walkie-talkies to deliver the service, as long as it works as promised.

Briere is president and Heckart is director of broadband at Telechoice, Inc., a consultancy in Verona, N.J. They can be reached at dbriere@telechoice.com and checkart@telechoice.com.

DON'T PANIC

Diagram your network with NetDraw Plus!

NEED TO DRAW a network upgrade *"what-if"* scenario? Need to create a quick and easy to read proposal for a customer who needs it yesterday?

DON'T PANIC! NetDraw Plus is the right tool for the job.

NetDraw Plus

IMAGE IS KEY: NetDraw Plus includes the most extensive collection of networking and computer clip art available today! Hundreds of new images have been added to our already comprehensive library, many of them completely manufacturer-specific. Simply drag these realistic images from the library to your drawing page, connect them up with our SmartLines, and you're done!

BIGGER IS BETTER: NetDraw Plus is also the only product of its kind to give you a full 50 inch-square work-space. Now it's simple to draw multi-ple-page diagrams. You can even define your own zoom level to get the exact frame of reference you need.

YOU'RE CONNECTED: You can link diagrams to images for "drill-down" capability. Or use our new Web Art® images to communicate your concepts on the Internet! Even export your diagrams in GIF format for use as Web page graphics on your own corporate intranet. Try doing *that* with your presentation program!

NO EXPERIENCE NECESSARY: You don't have to be a graphic artist to understand NetDraw Plus. Its clean, efficient user interface is simple to understand, easy to navigate and completely intuitive. And when you print your dia-grams get prepared for the compliments.

WAY MORE: Add to this OLE 2 automation and complete Windows 3.1/95/NT compatibility, and NetDraw Plus makes a powerful and flexible addition to your arsenal of weapons.
Call **800-643-4668** to request more information or to buy your copy today for just **$149!**

CLIP ART ONLY: If you already own a drawing application for either Windows or Macintosh, the NetDraw collection of clip art is available separately for just **$99**. NetDraw comes in both EPS and AI formats for Macintosh and Windows Metafile format for Windows. Either way, the images are a breeze to import into virtually any drawing application.

NEW! NetDraw Plus 3.0

Order today!

800-643-4668 or (508) 820-7493

Our **Fax-Back** information line at 800-756-9430 has complete product information and an order form! (When prompted, request document #10)

E-Mail your request for complete information to netdraw@nww.com.

NetworkWorld

NetworkWorld

TECHNICAL SEMINARS

Essentials of Networking *and* Data Communications

Technologies and Their Practical Application

Networks and communications systems are evolving with ever-increasing speed. Network technology options are broad in range, complex in nature and ultimately confusing. Interconnectivity is by no means a trivial issue and interoperability is still difficult to achieve.

Essentials of Networking and Data Communications is a dynamic, fast-paced, plain-English, common-sense and thoroughly understandable explanation of current and developing network technologies and communications systems. Acronyms are decoded, technologies are demystified, standards are put in perspective, and regulatory issues and trends are explained. The present and future "Networked World" is set in the context of meaningful and cost-effective business applications.

12 BENEFITS OF ATTENDING THIS SEMINAR . . .

1. Gain a comprehensive understanding of networking and data communications
2. Understand the fundamentals of transmission systems from analog to digital, from twisted pair through fiber optics and from wired through wireless
3. Gain a thorough understanding of LANs and LAN internetworking technologies, solutions and issues
4. Comprehend the basics of data communications protocols: line set-up, coding schemes, asynchronous vs. synchronous, error detection and correction
5. Understand the evolution of data networking, from DDS and X.25, through T/E-Carrier, ISDN, SMDS, Frame Relay, ATM and B-ISDN
6. Differentiate between bridges, routers, brouters and gateways — what they do and where they fit
7. Learn the nature of current and developing infrastructure technologies, including ADSL, HDSL, SONET, Wireless Local Loop (WLL) and hybrid local loops
8. Understand the differences between circuit, packet, frame and cell switching
9. Develop an informed and meaningful strategy for the transition to Broadband Networking through SMDS, Frame Relay and ATM
10. Compare and contrast the options for wireless data networking in the LAN, MAN and WAN domains
11. Develop a sense of carrier options — LECs, CAPs/AAVs and IXCs — as well as technology alternatives
12. Develop an informed and meaningful strategy for the deployment of emerging technologies, in the context of meaningful business applications

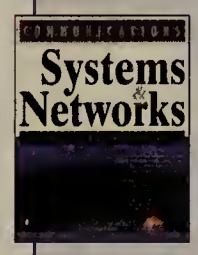
Whether you are seeking a firm foundation of networking knowledge or require a comprehensive update of current trends, this invaluable seminar will meet your networking and data communication knowledge needs by providing you with insights and a big-picture perspective of the fast-paced networking industry.

Developed and directed by Ray Horak, an internationally acclaimed network consultant, author and lecturer, this two-day seminar is informative and entertaining. Interactive case studies are interwoven throughout the day to illustrate the meaningful application of critical technologies presented.

1997 LOCATIONS AND DATES

Philadelphia, PA	Mar. 17–18	**Washington, DC**	Jun. 4-5
Dallas, TX	Mar. 20–21	**Chicago, IL**	Jun. 18-19
San Francisco, CA	May 28-29	**New York, NY**	Jul. 22-23
Boston, MA	Jun. 2-3	**Atlanta, GA**	Aug. 5-6

REGISTER AND YOU WILL RECEIVE . . .



- Comprehensive Seminar Workbook
- Copy of newly released *Handbook of Communication Systems and Networks* by course presenter Ray Horak
- Luncheon and break refreshments
- All of the above included in your $895 registration fee

Note: If you can't attend, call us and order this informative and useful attendee materials kit for just $99.95!

Web/E-Mail Information

Obtain full seminar information and register on-line in the Professional Development Group section on our Web site at:

www.nwfusion.com

OR

receive full seminar information via e-mail by sending a request to:

seminars@nww.com

Please put the word "DATA" in the subject field.

Call 1-800-643-4668

Register today for the seminar nearest you!

Dial Our **FAX-BACK** Information Line at

1-800-756-9430

for a complete seminar outline and registration form.

When prompted, request document #90.

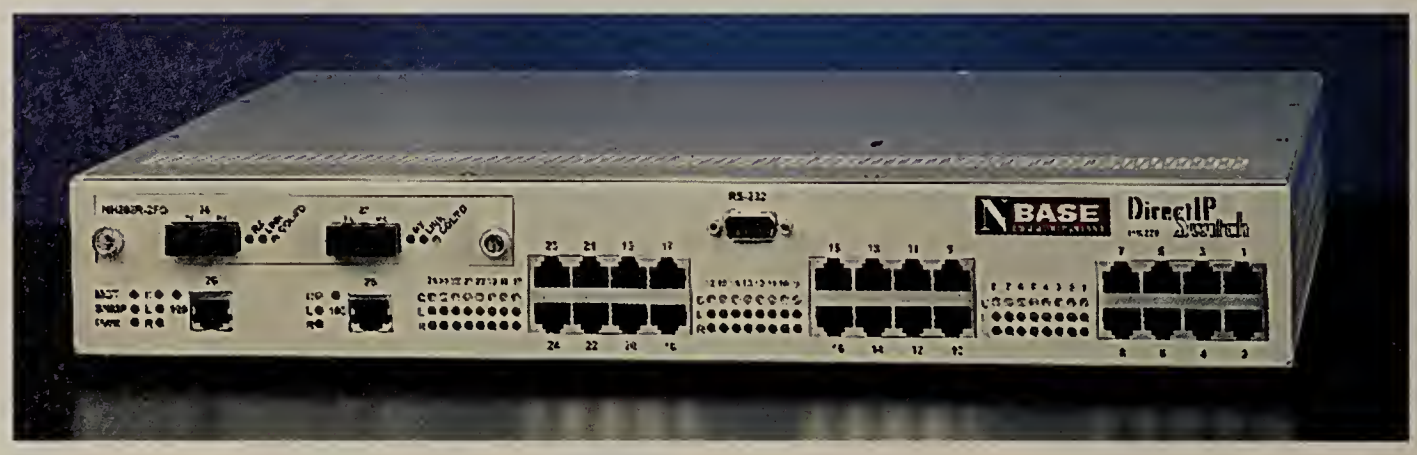
If you are interested in an on-site presentation of this seminar, please call us.

DirectIP™ Switching

Bringing The Switching Revolution To The World Of Routing

Why is DirectIP™ Switching required?

The explosion of Internet and Intranet applications, combined with the growing number of IP hosts, have increased IP traffic beyond the capabilities of routers. A Router needs to examine every single packet of information to determine where to send it, leading to a high level of complexity and low performance. And, because all traffic between different IP subnets passes through the router, it creates a bottleneck.



What is DirectIP™ Switching ?

The NBase DirectIP™ switch examines only the first packet in a stream of data and performs security checks to authenticate the connection. Once the connection is allowed, the entire stream will be forwarded to the destination through the switching fabric. By transforming the entire switched network into a huge IP switch, data can be sent much faster than through a router.

DirectIP™ by NBase is the only IP switching solution specifically engineered for the high performance needs of LAN infrastructure.

What benefits will DirectIP™ switching provide to your network?

- Wire speed IP forwarding, significantly improving network performance
- Scalability to any switching speed, supporting future network upgrades
- A high level of security options for limiting access to sensitive resources
- Lower installation and maintenance costs
- Redundancy options for mission critical networks

Why is DirectIP™ the best IP switching solution?

- DirectIP™ switching is based only on existing standards
- DirectIP™ works with any network adapter, with out requiring manual configuration
- A DirectIP™ Switch will even work with your existing switches, providing the full benefits of IP switching to a multi-vendor network
- DirectIP™ switching is not limited to any protocol and can be implemented with any LAN topology

To learn more about this revolutionary technology
visit our Web Site at www.nbase.com

NBASE COMMUNICATIONS

8943 Fullbright Avenue, Chatsworth, CA 91311 USA • 800/858-7815 • 818/773-0900 • Fax 818/773-0906
12401 Middlebrook Road #160, Germantown, MD 20874 USA • 800/966-4444 • 301/601-2800 • Fax 301/601-2902
Yokneam Industrial Park #1280, Yokneam, 20692 Israel • 972-4-993-6200 • Fax 972-4-989-2743
Voltastraße 6, D-63128 Dietzenbach Germany • 49-6074-49940 • Fax 49-6074-27974

Briefs

■ **AST Computer** *of Irvine, Calif., is upgrading its Manhattan S6200 server and its Commerce Pro server, an Internet-enabled version of the S6200. The* **servers,** *powered by a 200-MHz Pentium Pro processor, now feature a more versatile RAID controller, high-speed Ultra-Wide SCSI and 54G bytes of disk storage capacity.*

Prices for the S6200 start at around $6,500, while prices for the Commerce Pro start at around $8,450.

Both models will be available in April.

© AST: (800) 876-4278.

■ *Start-up* **Brocade Communications Systems, Inc.** *last week rolled out a* **Fibre Channel gigabit switch** *that allows customers to cluster servers and storage devices on a separate backbone network.*

The SilkWorm can support as many as 16 Fibre Channel ports, and as many as 32 switches can be interconnected to provide hundreds of connections.

The device is priced at about $3,000 and is available now.

© Brocade: (408) 588-4123.

■ **Standard Microsystems Corp. (SMC)** *of Hauppauge, N.Y., last week unveiled an* **ATM workgroup switch** *along with a network interface card (NIC).*

The TigerSwitch ATM supports 12 25M bit/sec ATM ports and provides three expansion slots for 155M bit/sec uplinks. SMC also rolled out Power25 25M bit/sec ATM NICs.

Pricing for the switch starts at $7,070, and the interface card costs $249.

Both products are available now.

© SMC: (516) 435-6000.

Gigabit Ethernet start-up readies rapid routing switches

By Jodi Cohen

Routing and speed don't usually go together, but don't tell that to Rapid City Communications.

The start-up last week rolled out its first family of Gigabit Ethernet products, which can switch and route on any port at wire speed.

The company claims its Fully Integrated Routing Switch Technology (FIRST) devices, which will be on display at the upcoming NetWorld+Interop show in Las Vegas, can switch or route more than 7 million IP packet/sec.

The routing switches also provide virtual LAN and prioritization features without degrading performance, said Joe Kennedy, Rapid City's president and chief executive officer.

One analyst said if Rapid City's performance claims are true, the company is obviating the need for Layer 2 switching.

"The only reason that the switching revolution ever took off is because routing was slow and expensive," said Glenn Gabriel Ben-Yosef, president of Clear Thinking Research, Inc., a Boston consultancy.

"If [Rapid City] can bring the price points down and bring the speed up, it lets customers put routing back into the network," he said.

Rapid City's FIRST 1200 *backbone chassis boasts a forwarding rate of 7M packet/sec routing, switching or a combination of both.*

FIRST family

Rapid City's FIRST products, which will compete with devices from Bay Networks, Inc. and Foundry Networks, Inc., include eight-slot, four-slot and stand-alone models.

The FIRST 1200 high-end backbone chassis boasts a 15G bit/sec switch fabric. It offers up to 96 autosensing 10M/100M bit/sec Ethernet ports or 12 Gigabit Ethernet ports for high-speed trunking or server connections.

The FIRST 600 wiring closet device provides about half the port density and performance as the 1200.

For high-performance desktops, Rapid City offers the FIRST 200, which can handle up to 16 10M/100M bit/sec Ethernet connections.

The 200 also has two slots for eight-port Fast Ethernet or two-port Gigabit Ethernet uplink modules.

All models support as many as 127 VLANs, which can be defined by protocol or IP subnet to provide broadcast control. Also, the FIRST family incorporates the Resource Reservation Protocol and the Internet Group Management Protocol to allow for quality-of-service capabilities.

Pricing starts at about $650 per 10M/100M bit/sec port and $2,500 per Gigabit Ethernet port. All FIRST devices will ship in June.

© Rapid City: (415) 237-7380.

NEC upgrades NT server line

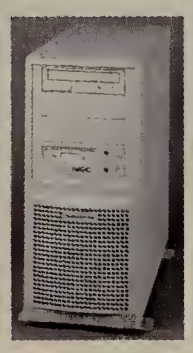
ProServa HX includes RAID hardware, CPU at no charge.

By James Niccolai
Mountain View, Calif.

NEC Corp.'s Computer Systems Division last week unveiled a fifth model in its ProServa line of network servers that will include free RAID hardware as standard, and five additional hot-pluggable disk bays for extra storage capacity.

Other new features in the ProServa HX for Windows NT include two hot-pluggable power supplies to reduce downtime and a free CPU, said Joseph Wei, director of product marketing.

Like its predecessor, ProServa SH, the HX model will include two or four 200-MHz Pentium Pro processors, each with 512K bytes of Level 2 cache.



NEC's ProServa HX *for Windows NT includes two or four 200-MHz Pentium Pro processors.*

Almost all NEC customers choose to incorporate RAID in their systems, "so we decided to take an aggressive marketing position by offering RAID at no extra price," Wei said. The PCI-based dual channel Mylex RAID controller has 4M bytes of parity-protected disk cache and can be optimized for performance or data integrity.

The ProServa HX comes with 12 hot-pluggable disk bays, providing more than 100G bytes of storage capacity.

Two standard power supplies can be augmented with an optional third unit. In the case of a power supply failure, the system will continue to function when all three are configured, Wei said.

The system also is designed to support the arrival of the year 2000. "On the second after midnight the system clock will tick over to four-digit mode," Wei said.

The HX is slated to be available in April and will cost about $15,000 for a base system.

For more information, contact NEC at (415) 528-6000.

Niccolai is a correspondent with IDG News Service's Boston bureau.

IBM tightens NT-Warp Server link

By Christine Burns
Austin, Texas

IBM last week rolled out beta software that will simplify Windows NT Workstation ties to OS/2 Warp Server and beef up remote access to IBM LANs.

The new Windows NT Workstation connectivity software, dubbed Primary Logon Client for Windows NT, lets end users log on to all Warp Server network services without first logging on to a Windows NT server.

The enhancement cuts administration and equipment costs, said Steven King, Warp Server product manager for IBM's Personal Products Division. "It decreases the number of machines required to give NT Workstation users access to Warp Server and the costs of managing multiple server environments," King said.

The software enables all NT Workstation user profiles and system policies to be stored by Warp Server. This feature allows support for roaming users and rounds out IBM offerings for giving the administrator central control of all NT, Windows 95, OS/2 Warp 4 and DOS clients.

IBM also enhanced Warp Server's remote access capabilities by adding support for clients that natively support PPP. This allows dial-up connectivity to Warp Server for Windows NT and Windows 95 machines as well as clients using IBM's 8235 dial-in access technology for Application System/400-based nets.

Users can contact IBM to enroll in both beta programs. General availability is expected next quarter.

© IBM: (800) 426-3333.

WIRED WINDOWS

There may be a place for the NetPC

There's no place like home for the network computer (NC) touted by Oracle Corp. Chairman Larry Ellison. At least that's where I figure its place is.

However, the NetPC promoted by Intel Corp. and Microsoft Corp. has a decent shot at being a useful corporate network component.

NetPCs are regular PCs but most likely without disk drives or sporting only a small hard drive. The major difference between the NetPC and your current PC is supposed to be the NetPC's improved manageability, the result of new hardware and software that notifies PC administrators of problems they can then diagnose and fix over the network. Integral to this solution is the ability to boot up the machine either manually across the network or on a schedule so periodic maintenance can be performed.

But how much is new and how much is hype?

Frank Gill, an Intel vice president and general manager of the company's Internet and Communications Group, recently discussed the NetPC during a keynote speech at Spring Internet World '97. He also demonstrated software that can diagnose many simple problems, such as applications that are missing drivers and software that sends E-mail to the support staff to notify them of problems. NetPCs should also eliminate many help desk calls by preventing end users from messing around with their desktop configurations, Gill added.

In his address, Gill also stated it was too early to estimate how much money the NetPC could save customers. Instead, he showed lots of flashy demos touting the promise of NetPCs attached to the 'Net and intranets.

Dave Kearns

What he didn't tell the audience but admitted to reporters later on was that these applications couldn't work on the NetPC as envisioned today because most end users don't have enough bandwidth. Further, Gill admitted that while he considered the NetPC to be a good idea, he would never use one. I'd wager that most of us would have the same reaction.

What Intel and Microsoft aren't saying is that you can have many, if not all, of the NetPC benefits today using fully powered computers with off-the-shelf software. You can buy PCs with 486 CPUs, 500M- to 800M-byte drives and 16M bytes of RAM for $600 to $800 today — the same price range being hyped for the NetPC and even the NC.

I'd like to hear from those of you using desktop management and troubleshooting software, such as Symantec Corp.'s Norton Administrator, Microsoft's Windows 95 policies and Novell, Inc.'s Network Application Launcher. Let me know what you think your savings are from going this route.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at dkearns@msn.com.

Tip of the week

IBM has announced Windows 95 and Windows NT versions of the IBM Salutation Manager software toolkit. Based on the Salutation Consortium's architecture (www.salutation.com), the toolkit can be used for easing communication between PCs and peripherals, office machines, applications and services across the Internet.

Briefs

■ *Users of* **Novell, Inc.'s GroupWise** *software can now view their Universal Mailboxes through the* **Nokia 9000 Communicator** *and Nokia PC Cards from Nokia Mobile Phones Com-*

munications of Helsinki, Finland. GSM-compatible, the 9000 Communicator is pocket-size and provides access via GroupWise to documents, E-mail, voice messages, faxes and appointments. Nokia PC cards provide wireless data transmission via digital portable phones.

© Nokia: (800) 456 5553.

■ **Segue Software, Inc.** *in Newton, Mass., has released SilkTest, the first piece of a new product line that lets software developers* **test Web applications** *from the browser interface to the back-end databases. The software can recognize HTML, Common Gateway Interface scripts, and ActiveX and Java components, and test these in any browser.*

A prerelease version is ready now; the final product is due out around May and will cost $4,495 per developer.

© Segue: (800) 287-1329.

■ **SuperNova, Inc.** *of Edison, N.J., this week will unveil SuperNova/Visual Concepts, a software component framework that lets corporate developers encase legacy and new client/server applications in a component wrapper. These components can then be incorporated in distributed applications, with communications via Internet Inter-ORB Protocol.*

Visual Concepts is now in beta test; delivery is expected in May.

© SuperNova: (908) 248-6667.

IBM throws its weight behind Java

By John Cox

The hottest and perhaps most important Java upstart around these days is not one of the many tiny venture-funded software firms with cool-sounding names. It's not even Sun Microsystems, Inc., which came up with Java.

It's IBM.

Throughout 1997, IBM will be releasing beta and production Java products that cover almost the entire range of application development needs. All of these products have one goal: to give Java the muscle and brains it needs to handle mission-critical Web applications.

Despite Java's momentum in the market, it still faces many challenges. A recent International Data Corp. (IDC) study found that most corporate development groups have yet to examine Java for developing business applications.

IBM's *Mills says Java is a strategic platform because it will let customers write and run a new generation of applications across many computer architectures.*

Go online for more info, including:

- **IBM's Java initiatives**
- **Financials and other stories about IBM**
- **Java primers and resources**

Enter the number above in the DocFinder box on the home page.

In addition, Java faces formidable competition from Microsoft Corp.'s ActiveX, a specification for building interoperable components in C++ and Visual Basic as well as Java.

But IBM is behind Java 100%. Chief Executive Officer Louis Gerstner promotes Java every chance he gets, and IBM has made a huge investment in the technology: hundreds of millions of dollars and more than 1,200 programmers. In fact, in December 1995 IBM became one of the first companies to license Java from Sun and has worked closely with Sun's JavaSoft subsidiary ever since.

"It wasn't hard for us to say, 'Let's go for it,'" said Steve Mills, general manager of IBM's Software Solutions Division. "We saw Java as solving a lot of the problems we were struggling with."

Java already can run on nearly all of IBM's operating systems. In addition, Java applets can access data in DB2 databases and, via a gateway, transactions on CICS servers.

The following are some other Java initiatives in the works at IBM:

- Recasting the OpenDoc component technology as a set of containers that will let JavaBeans, ActiveX Controls and C++ objects interact on a downloaded Web document. Beta testing will begin midyear, with availability possible by year-end.
- DataBolts, which are reusable JavaBeans for automatically accessing server-based information. IBM is working with 63 information publishers to create DataBolts for each. Beta testing for the first DataBolts starts this month, with availability slated for midyear. Also in the works are DataBolts with built-in encryption and copyright management.
- Compilers that translate Java code to run on a target operating system such as AIX, OS/2 or OS/400. IBM researchers said the compiled code runs 10 to 50 times faster than Java running on a Java Virtual Machine, which interprets Java code.
- WebCutter, a Java tool that sifts through masses of URLs based on end users' or Web site managers' interests, then creates a map to show interrelated information. One version has been released to select Lotus Development Corp. Domino customers.
- Reusable JavaBeans components, including Lotus' KonaBeans for desktop tasks such as graphing and charting. Other beans will be aimed at multimedia training, sales management, human resources and market research.
- Application development tools, including AppletAuthor, a graphical environment for collecting JavaBeans into larger applications. It is now in beta test and is due to be released soon. Also in the works is VisualAge for Java, a full graphical development environment for building client and server Java applications.

A SAMPLING OF IBM'S JAVA PROJECTS

Project	Location
Application development tools	
VisualAge for Java development tool set	Toronto
Optimizing compilers for faster Java performance	Hawthorne, N.Y.
Development tools and Java agents	Raleigh, N.C.
Java agents	Almaden, Calif.
WebCutter advanced Web searching and mapping	Haifa, Israel
Just-in-time compilers	Tokyo
Middleware and platforms	
Java for OS/390	Poughkeepsie, N.Y.
Java access to DB2	Santa Teresa, Calif.
Transaction processing, Java ports and Java clients for CICS and MQSeries	Hursley, England, and Pittsburgh
Network computer	Austin, Texas, and Greenock, Scotland
Lotus Domino Web-based groupware and JavaBeans	Cambridge, Mass.
Components	
San Francisco Project (Java application frameworks)	Rochester, Minn.
DataBolts and Cryptolopes data access and security technology	Falls Church, Va.
JavaBeans development	Five sites worldwide

IBM is percolating Java throughout every part of customers' computing architectures, one analyst said.

"For Java to become pervasive, it needs to populate many different echelons of the development spectrum," said Evan Quinn, an IDC analyst.

And that's exactly IBM's goal.

"To make Java real for business, we're putting Java everywhere in the operating systems and network computers, we're making enterprise data accessible to Java programmers, and we're creating tools and resources for building complete Java solutions," said Simon Phipps, IBM's program manager for Java technology.

The approach, and IBM's extensive consulting experience, is exactly what many corporate MIS groups want.

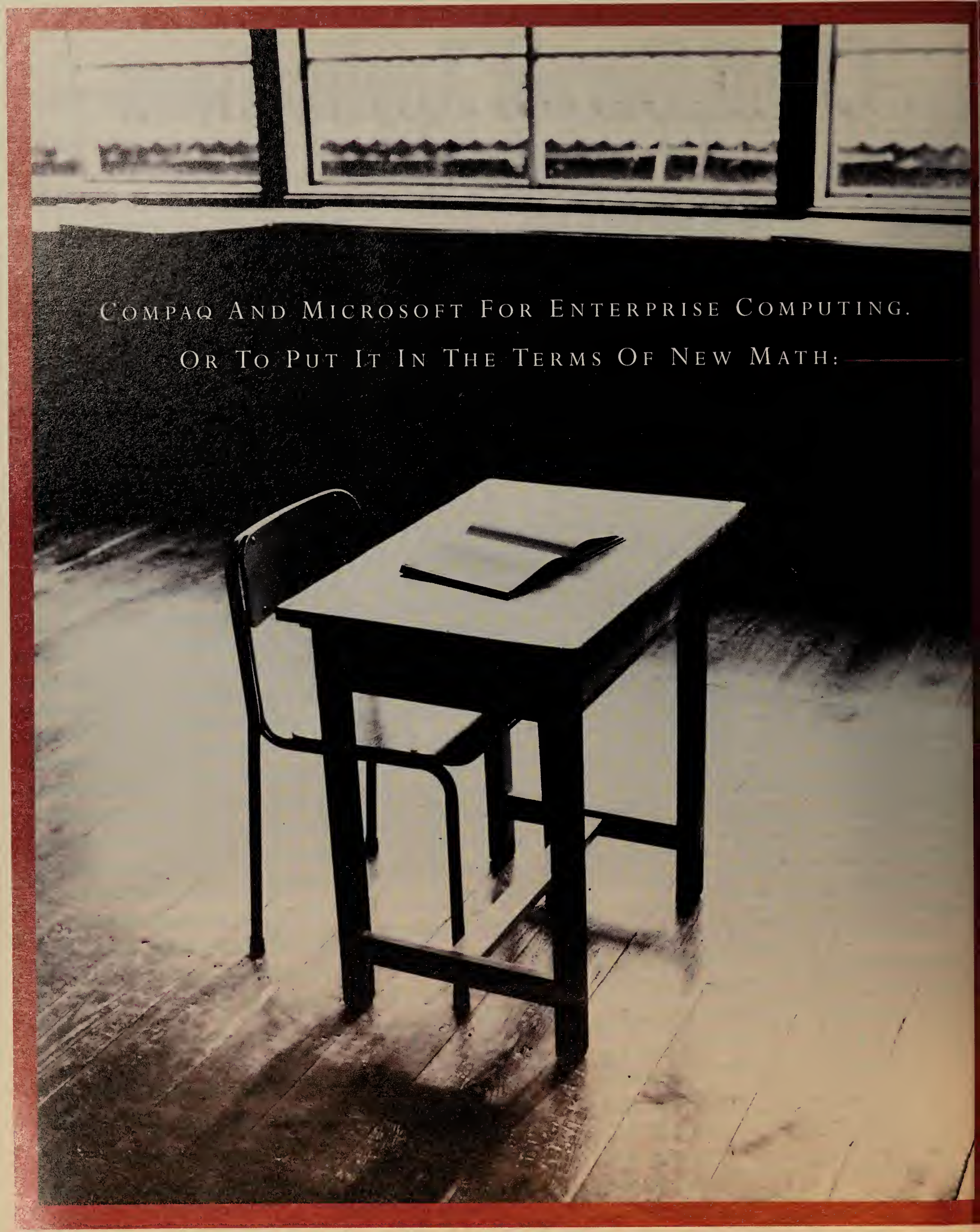
"They are going full-bore on this," said James Chong, vice president of architecture and planning for Charles Schwab & Co., Inc.'s IS subsidiary, which is building a Web-based brokerage system with support from IBM.

"Java is a nice way to bring the back-end transaction processing systems into the object arena," Chong said. "We can wrap our legacy CICS systems with Java and turn them into objects, which we can then expose to the brand-new world of objects we're building for the desktop."

IBM has seized the potential to write an application in Java once and run it anywhere.

"You get a lot of benefits from that," IBM's Mills said. "For one thing, it enhances the ability of businesses to tie together heterogeneous systems. And there's a need for this in a huge section of the market."

Another benefit is faster development and deployment of Web-based applications that interact with new audiences, such as consumers or business partners. ■


COMPAQ AND MICROSOFT FOR ENTERPRISE COMPUTING.
OR TO PUT IT IN THE TERMS OF NEW MATH:

1+1=3

Three? Yes. Add the number one PC/Server maker in the world plus the world's number one software developer and you get something they don't teach in business school. (At least not yet.) The world's most robust enterprise platform* to drive your business. And the seamless integration of products with unsurpassed reliability.

It used to be that you could only get performance like this with the old school, RISC/UNIX. But now Compaq ProLiant and ProSignia servers, along with the Deskpro line and Professional Workstations rocket Microsoft® Windows NT® Server and Microsoft Windows NT Workstation operating systems. Now you get not only high performance but also the reliability that your business demands. (Note: the ProLiant 5000 has consistently achieved the best transaction performances with Windows NT on the TPC-C benchmark.)

With literally thousands of applications to choose from, there's flexibility. Deploying is simple too, as is management with Compaq's Insight Manager, Intelligent Manageability and Microsoft Systems Management Server. And not just today and next week but throughout the system's life span. Just the fact that there's one-stop, Frontline Partnership accountability eliminates the headaches.

Throw into the purchase equation a host of scalable Internet/Intranet solutions, plus one of the lowest overall ownership costs running and you're looking at the results of this new math on your bottom line as well. For white papers or additional information, visit us at www.compaq.com/solutions/frontline/ or www.microsoft.com/ntserver/info/.

COMPAQ Microsoft®

FRONTLINE PARTNERSHIP

*Based on published TPC-C results as of 12/27/96. The TPC-C test is a transaction-oriented OLTP environment. TPC is a trademark of the Transaction Processing Council. In Canada, we can be reached at 1-800-567-1616.

X.500 backers look for a breakout performance

By Paul McNamara
Arlington, Va.

Buffeted for years by naysayers and reluctant vendors, advocates of X.500-based technology know they must do more than talk a good game if their dream of a global directory is ever going to materialize. In short, they need to deliver the goods.

Toward that end, 19 companies and organizations will participate in Directory Challenge '97 at the Electronic Messaging Association's (EMA) annual conference in Philadelphia April 8 to 10. The live demonstration will feature a variety of applications taking advantage of X.500-based Directory Service Agents located in seven countries.

"We're taking directories where they have never been before," said Joanne Ghahremani, leader of the EMA challenge and a senior member of the technical staff at British Telecommunications, plc in Reston, Va. Essentially, that means moving directory-based applications outside of the comfy confines of closed corporate systems and into the more challenging arena of "communicating over real-world circuitry, namely the Internet."

ACCEPTING THE CHALLENGE

Among the companies demonstrating X.500 directory technology at next month's EMA conference in Philadelphia are:

- BT
- Control Data
- Enterprise Solutions
- ICL
- Isocor
- Lotus
- MaXware
- Mitre
- NEXOR
- Siemens Nixdorf
- St. Paul Software
- Telstra
- Tradegate ECA
- Unisys
- WorldTalk

Established in 1988 and overhauled five years later, the X.500 standard was designed to facilitate directory interoperability.

But it has suffered from a multitude of raps: insufficient security for sensitive business transactions; limited user-access control; undue complexity; and most recently, what X.500 proponents call the misconception that the Lightweight Directory Access Protocol offers a better path to interoperability.

Ghahremani said the improvements added to X.500 in 1993 are just now bearing fruit in terms of addressing those complaints and having more mature applications reaching the market, an evolution Directory Challenge '97 is meant to highlight.

Conference attendees visiting the Challenge Pavilion will view the demonstration applications on Intel Corp. Pentium PCs running Windows 95.

"Behind what you see on the floor is an infrastructure that is spread around the world," said Paul Van Avery, director at FTT Consultants in Roswell, Ga.

The network of X.500 Directory System Agents will run on a variety of platforms — including Solaris and Windows NT software, and RISC System/6000 and Alpha hardware — located in the U.S., Canada, the U.K., Norway, Ireland, Japan and Australia. They will connect to the Challenge Pavilion and each other via TCP/IP and X.25.

"A lot of other applications for messaging and electronic commerce won't reach their potential unless a robust, common directory is in place," said Paul Moniz, EMA technology director. "You can get only so far without that directory piece."

✆ EMA: (703) 524-5550.

You Can't Survive Without It.
The Internet Commerce Expo.

April 8-11, 1997 • Atlanta, Georgia
September 8-11, 1997 • Los Angeles, California

The World's Premiere Exposition and Conference Dedicated To Internet Commerce and the Intranet.
The Internet Commerce Expo brings innovative solution providers and knowledgeable buyers together in a powerful Internet technology exposition and conference. It's your chance to get in on the hottest Internet action in the county. Don't miss it!

For Exhibitors: highly qualified, enterprise buyers will be there.
There will be thousands of motivated buyers actively looking for the new products that have made the Intranet and Internet commerce practical and secure. There is simply no better way to reach this hot-to-buy audience than ICE. Corporate decision makers will be there in huge numbers looking for productivity enhancing solutions... and they'll find what they're looking for at ICE.

For Attendees: the coolest way to find the hottest IT solutions.
Hundreds of the leading hardware, software and network services vendors will be on hand to show you how to increase productivity and profitability via the latest Internet technology. ICE is the best and biggest event in the country for getting directly in touch with the providers of the hottest Internet solutions for the enterprise. That's why this is the show your simply cannot afford to miss. If you can attend just one show this year, better make it ICE.

In addition, the focused content of Internet Commerce Expo's industry-leading conference program will address the needs of developers, IT and business managers and senior executives.

ICE. If its hot its here.
There's a hard new truth in the world of business today, and it goes like this: Internet commerce is the force driving business into the next millennium. So if you're a vendor with a compelling Internet solution for the enterprise... or a corporate decision maker looking for productivity enhancing products, you need to be where it's hot.

See ICE on the Web: http://www.idg.com/ice

ICE℠
INTERNET COMMERCE EXPO
INTERNET SOLUTIONS FOR THE ENTERPRISE

IDG
An International Data Group Company

April 8-11, 1997
Georgia World Congress Center
Atlanta, Georgia

September 8-11, 1997
Los Angeles Convention Center
Los Angeles, California

Sponsored by:
COMPUTERWORLD
NetworkWorld
SunWorld Online
CIO
INFOWORLD
WEBMASTER
JavaWorld
NETSCAPE WORLD

Please put me on ICE! I would like more information on: ○ Exhibiting ○ Attending ○ Atlanta ○ Los Angeles

Name_____
Title_____
Company_____
Address_____
City/State/Zip_____
Phone_____ Fax_____
e-Mail_____

Mail to: Internet Commerce Expo, 111 Speen Street, P.O. Box 9107, Framingham, MA 01701. Or Fax to: 508-370-4325 Phone: 800-667-4ICE

NW

When's the best time to talk about remote access expertise?

Your Sales Manager just spent an hour trying to dial in. He thinks it's now.

There's nothing more frustrating than not being able to get the information you need when you need it. But you've probably been told that already.

So here's something that will help.

Cisco offers you a complete range of remote access solutions to meet the needs of everyone from the central site out to your mobile users, work-at-home folks and dedicated telecommuters.

So what makes a Cisco remote access solution better than what you're using now? In a word, experience.

Cisco is the world leader in networking technology. Our hardware and software technologies built the Internet. Even today, virtually every message that travels across the Internet travels through Cisco equipment.

And now you can enjoy that same networking expertise in a dialup access solution. A solution designed by a company that understands every aspect and detail of your network environment. So buzzwords like reliable, secure, scalable and cost-effective become real-world realities.

Find out more for yourself by calling 1-800-778-3632 ext. 189000 for our free Product Selection Tool and Telecommuting Guide on CD. Or visit us on the Web at www.cisco.com/access/dialup/

We can help you make sure your people get the information they need when they need it, with a remote access solution that works. Pure and simple.

The Network Works. No Excuses.™

What if you could invest in technology without freezing yourself in time

At the rate technology advances, too often the instant you make a purchase, it's obsolete. For WAN solutions, this can mean choosing between a frame relay platform for where you are, or an ATM platform for where you want to be. The Alcatel 1100 HSS™ multiservice switch from Alcatel Data Networks lets you avoid this trap by handling ATM or frame relay– or both– in one flexible platform. With plug-in boards that make it not just a timely answer to today's rapidly changing network needs, but an excellent investment for the future. To learn more, call **1-888-ADN-2500** or (703)724-2878, or visit http://www.adn.alcatel.com.

ALCATEL

WE HELP YOU GROW

Circle Reader Service # **23**

A Network World Supplement

March 1997

IntraNet

Intranet makeover

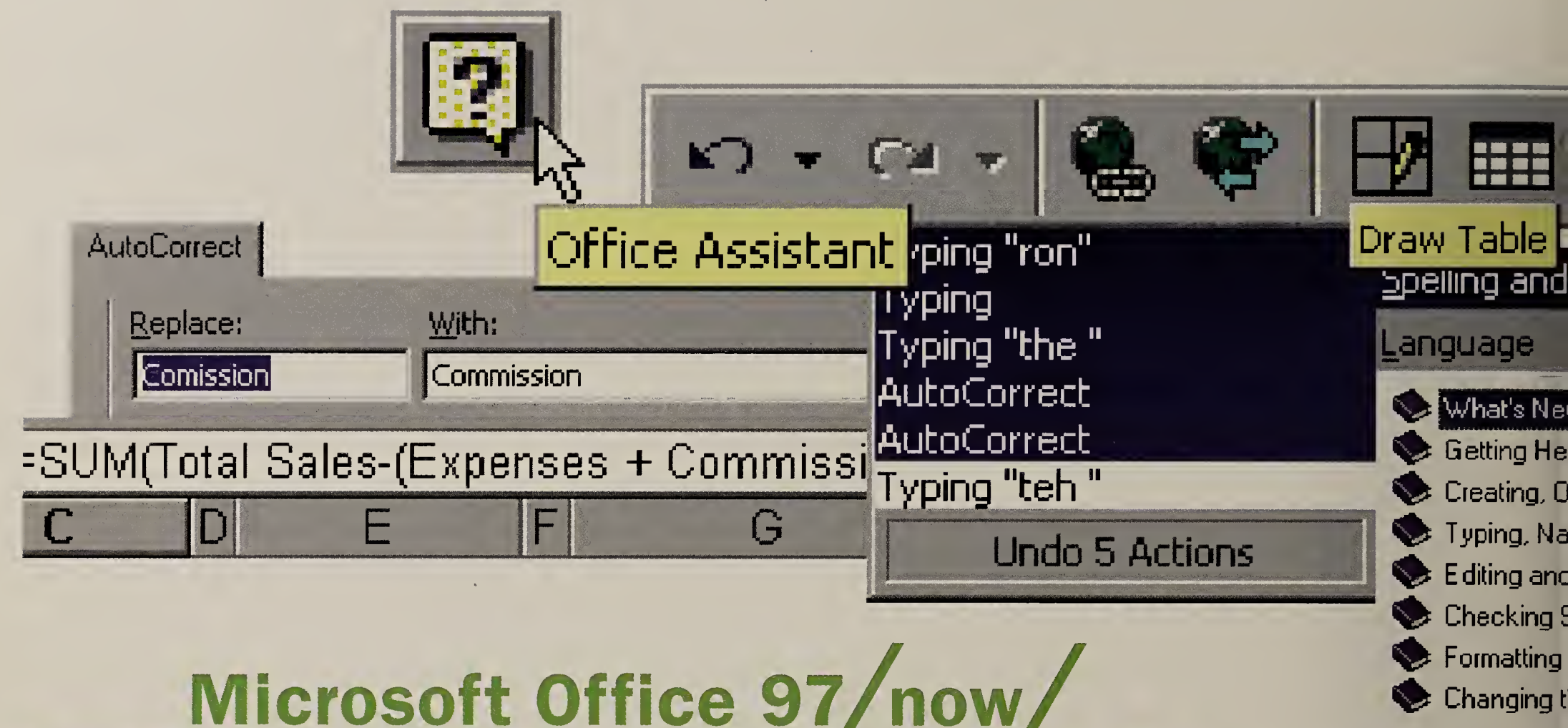
We ask Patricia O'Hern and Andrea Spertus of USWeb Utopia to redesign Acxiom's W

Page 22.

Also inside

- **Rightsizing and intranets at Westinghouse**
- **Handbook: What makes Perl shine?**
- **Paul Mockapetris on intranet naming systems**
- **Marvel or monstrosity? A builder's guide**
- **Review: Level Five's data mining Quest**

Capita[illegible] on Internet Technologies



Microsoft Office 97/now/

There's nothing from your users.

ing, and Saving Documents
ting, and Selecting
ting
ing and Grammar

ppearance of Your Page

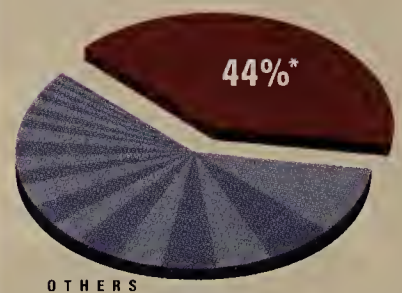
like not hearing

Bring us your writers, your artists, your number-crunchers, your Web surfers and table aficionados and remote access junkies, your askers of questions difficult and mundane. We have new Microsoft® Office 97 for them. We have extraordinary Web capabilities for them. We have hundreds of improvements for them, from natural-language formula writing in Microsoft Excel to Multiple Undo (aaaaaah). And we have answers for them, in the form of Office Assistants: an elite squad of troubleshooters designed to help your people. Office Assistants can answer questions written in plain English. They'll offer tips. And they provide walk-throughs that show regular folks how to complete extraordinary tasks all by their lonesome. So your users will call less often. And you can raise your relationship with them to a whole new level of non-communication. If that sounds even remotely enticing, please drop by our Web site to find out more.

Where do you want to go today?® www.microsoft.com/office/ Microsoft®

Need a Better Approach to Network Security? Follow the Leader.

MARKET SHARE LEADER



CHECK POINT *FireWall-1*™

With installations at thousands of customer sites worldwide, FireWall-1 is the most widely tested and trusted solution on the market.

*Source: the Yankee Group, 1996

The Internet has opened up a world of connectivity. Intranets. Extranets. VPNs. Internet Commerce. You can't afford to lock yourself out. But how can you enable secure connectivity?

Policy-based Enterprise Security

Presenting Check Point™ FireWall-1.™ Based on an entirely new technology called Stateful Inspection, FireWall-1 is the only solution to fully address the requirements of enterprise-wide security:

- *security for all Internet/Intranet/Extranet applications*
- *standards-compliant authentication and encryption*
- *anti-virus, URL and Java/ActiveX screening*
- *connection control including load balancing and address translation*
- *centralized management for multiple firewalls*

The entire product suite is unified by Check Point's **OPSEC** (Open Platform for Secure Enterprise Connectivity) policy management framework. Third-party security applications plug into OPSEC for an end-to-end solution that is centrally configured and managed.

Unlock the promise of the Internet. Deliver secure enterprise connectivity with Check Point FireWall-1.

To learn more about enterprise security, attend a symposium sponsored by leading industry analysts. Visit our Web site for a complete list of cities and dates, and to request your FREE CHECK POINT FireWall-1 demonstration CD-ROM.

www.checkpoint.com

CHECK POINT™
Software Technologies Ltd.

I N S I D E

IntraNet

March 1997
Volume 2, Number 3

From the Editor

Empowerment. The concept is the darling of self-help groups and civil rights movements. But as trite as it sounds, it is what intranets are all about.

Load a Web server with files, forms, directories, audio and video clips — whatever you want, really. Then give employees access via a Web browser and, voila!, you've empowered them.

Well, sort of. What you've really done is given them the opportunity to empower themselves. It's up to them to take advantage of or ignore the corporate information they can now so easily access. But is it safe to leave it at that?

Even at their most basic, as platforms for the simple posting of static Web pages, intranets are an incredible corporate asset. As they mature, allowing interactivity among employees and with business partners or customers, they'll only become more invaluable. It doesn't make much sense, then, to leave an intranet's power to the whimsy of employees.

Some employees, after all, still aren't comfortable turning on their computers, let alone using applications.

The status quo has got to go, and this means it's simply not enough to be an intranet builder. You've got to do whatever it takes — from giving away intranet T-shirts to obtaining an executive mandate — to get every employee to think of the intranet as an indispensable tool.

Beth Schultz, executive editor
(bschultz@nww.com

FEATURES

Westinghouse's Dennis Kelly (left) and Gary Ellis push for the state of the art.

DEPARTMENTS

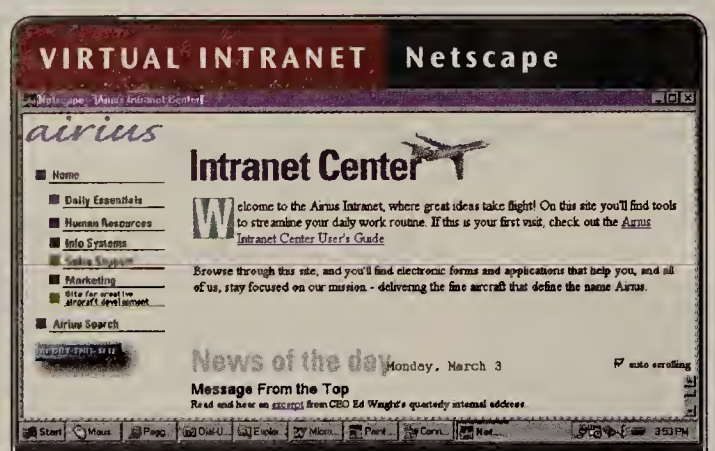
IntraNet is a supplement to *Network World*, the leading newsweekly for enterprise network executives. *Network World* is published by International Data Group of Boston. *Network World*, 161 Worcester Road, Framingham, MA 01701. Phone (508) 875-6400, Fax (508) 820-3467, E-mail nwnews@nww.com.

Your virtual connection to newsbits, opinion, insight, humor and other marginalia from planet intranet.

hot links

Model intranet opens on 'Net

Netscape Communications Corp., which lives by a "try before you buy" philosophy, is flinging open virtual doors and inviting tours of a model intranet.



Netscape Virtual Intranet features the fictitious Airius Aircraft, complete wtih departmental sites and streaming bulletins.

At www.netscape.com/comprod/at_work/vip/index.html, Netscape demonstrates the intranet of a fictitious company, Airius Aircraft. Users with Java-aware browsers can log on just as if they were entering a real corporate intranet, check the employee phone book, send E-mail and see what Airius departments are doing.

Potential customers also can download the applications for the virtual intranet, which is part of the Netscape AppFoundry program, and tailor them to their own needs.

Set aside those business blues

Intranet managers floundering around in business issues associated with developing and maintaining the corporate Web might feel less overwhelmed with a set of resources just hitting the market.

Mansfield + Associates (M+A), a digital marketing agency, has pulled together a range of resources intranet managers can use to address strategic and tactical business issues. The package, called Intranet Pro Kit, includes a manual, CD-ROM and access to a Web site (www.intranetdevelopers.com).

"Webmasters are on safe ground when it comes to technical issues like integrating Notes and assessing bandwidth, but they feel exposed when it is time to present the information to their bosses or to decide how to strategically plan and launch an intranet," says Peter Mansfield, president of M+A in Los Angeles.

The kit includes templates for home page layouts with matching mastheads, icons and toolbars; a library of buttons and graphics; customizable site structure maps; sample E-mail messages, memos and presentations; spreadsheets for calculating return on investment; and worksheets.

A single copy of Intranet Pro Kit costs $99.

Dance lessons

Geffen Records, Inc. is in the music and video business, so it comes as no surprise that its intranet is popping with multimedia. But no matter its business, every corporation should build a lively intranet, says Jim Griffin, vice president and technology director at Geffen.

"When you empower people to contribute to your intranet, you let it dance," Griffin says.

Griffin discussed Geffen's intranet at "Implementing and Managing Internal Web Sites," a conference sponsored last month in San Francisco by the International Quality and Productivity Center. Griffin offers these tips for setting Web technology to music (figuratively, that is):

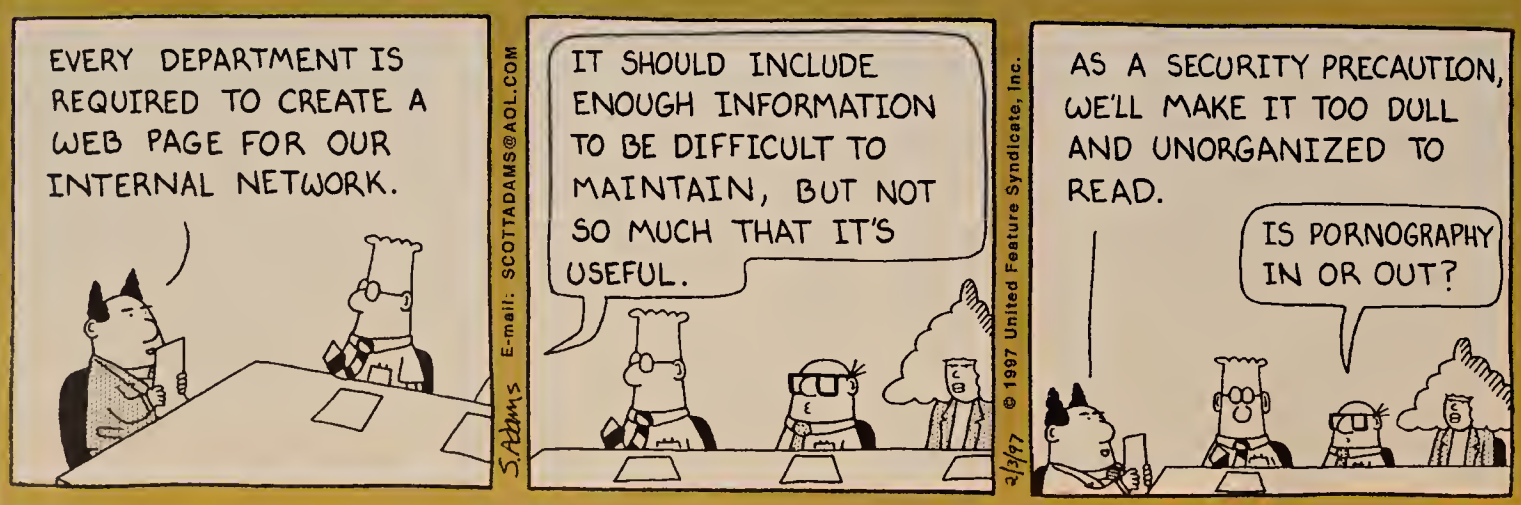
- **"Stick with standards. You don't know with whom your company might merge or what data type your suppliers might use."**
- **"Fill your intranet with valuable intellectual property."**
- **"We are leaders within our companies. Mingle with other departments and teach employees how to use the intranet."**
- **"IT is no longer typewriter repair. Your task is to help your company make money."**
- **"Route IP everywhere and give your people access both for home and work."**
- **Write to the browser when doing original development; but increasingly, that task can be left to the browser vendors. Document management and organizational structure can be IT's focus.**

Dilbert does intranets

Artist/author Scott Adams claims he has no particular insight into the worth and future of intranet technology, but he recently turned his attention to corporate Webs in his Dilbert® comic strip.

Dilbert, who is every IT manager's favorite nerd, was helping develop internal Web sites in a pair of strips that ran last month. His intranet efforts were, of course, in addition to his regular duties.

Adams, who worked at Pacific Bell until last year, has no shortage of ideas for Dilbert's next dilemmas — his E-mail address runs with the strip and Dilberts everywhere send him field reports.



DILBERT reprinted by permission of United Feature Syndicate, Inc.

High-Speed Internet Services With Bulletproof Reliability.

For Internet and Intranet solutions from 56K to T-3, only UUNET provides the reliable performance today's businesses require. UUNET's unique hub architecture combines advanced switching and routing technologies to move critical data quickly and efficiently. And additional bandwidth is readily available as needs expand. UUNET's world-wide backbone is fully-redundant at every link so there's always a clear pathway for data to get through. More than 25,000 business customers already rely on the only Internet provider created just for business. To put that experience to work for your company, simply call 1 800 465 7185.

UUNET TECHNOLOGIES

THE INTERNET AT WORK™

http://www.uu.net/nw8 info@uu.net

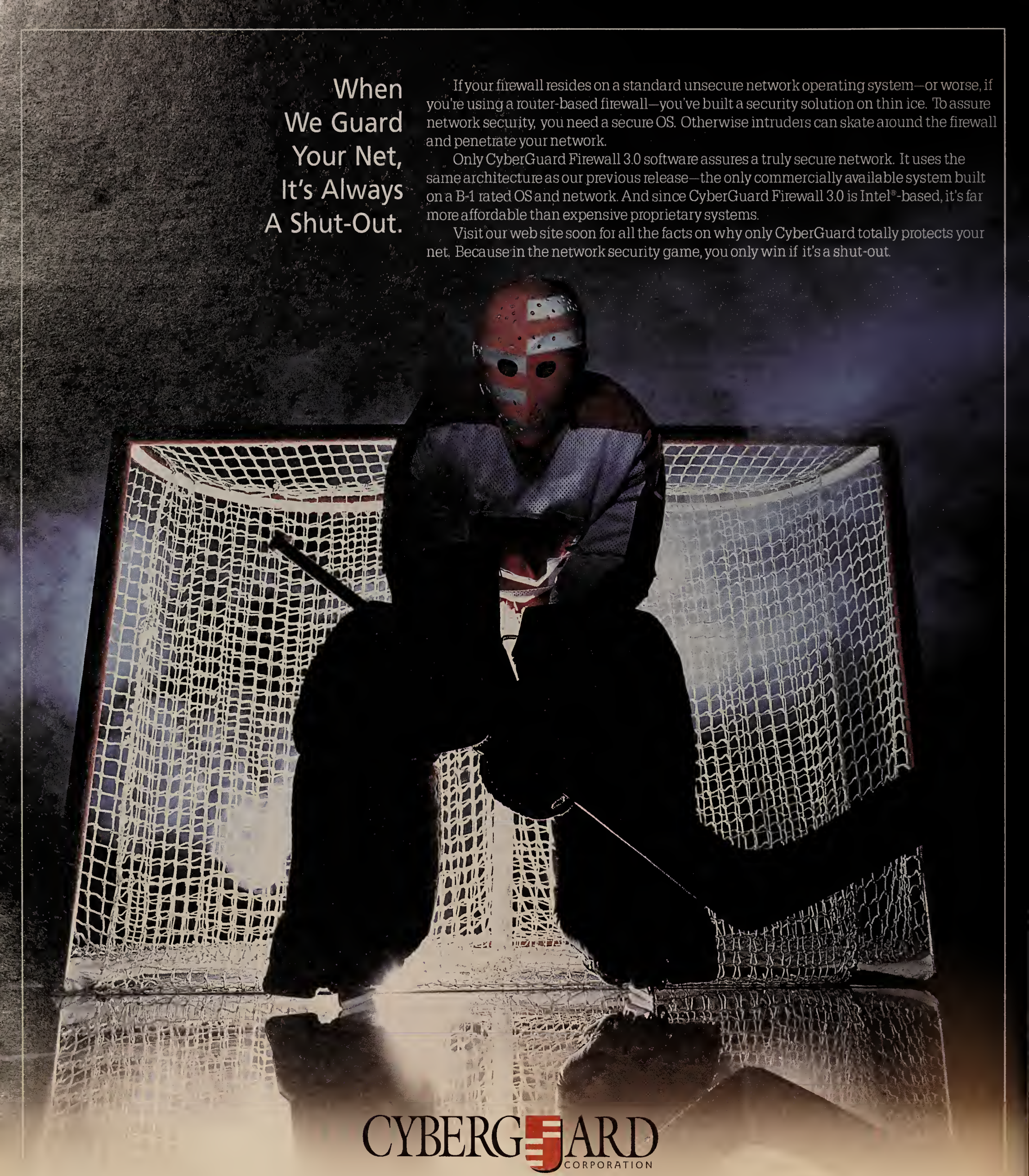
USA: +1 703 206 5600 Canada: +1 800 463 8123 UK: +44 (0) 1223 250 100 Belgium: +32 3 281 49 83
Netherlands: +31 20 696 60 54 Luxembourg: +352 440 291 VARs/Resellers: +1 703 208 5269

When We Guard Your Net, It's Always A Shut-Out.

If your firewall resides on a standard unsecure network operating system—or worse, if you're using a router-based firewall—you've built a security solution on thin ice. To assure network security, you need a secure OS. Otherwise intruders can skate around the firewall and penetrate your network.

Only CyberGuard Firewall 3.0 software assures a truly secure network. It uses the same architecture as our previous release—the only commercially available system built on a B-1 rated OS and network. And since CyberGuard Firewall 3.0 is Intel®-based, it's far more affordable than expensive proprietary systems.

Visit our web site soon for all the facts on why only CyberGuard totally protects your net. Because in the network security game, you only win if it's a shut-out.



CYBERGUARD CORPORATION

www.cyberguardcorp.com

2101 West Cypress Creek Road · Fort Lauderdale, Florida 33309
800.666.4273, ext. 5213 · 954.973.5478, ext. 5213 · fax 954.973.5160
CyberGuard Europe Limited ·Riverside Way, Watchmoor Park, CAMBERLEY·Surrey GU15 3YD·tel+44(0) 1276 683713·fax+44(0)1276 678733

Circle Reader Service #2

Perl: Putting practicality before beauty

BY MARK GIBBS

When it comes to creating system-level applications in general, and Web server scripts in particular, the Perl programming language stands out with its maturity and power.

Perl, an acronym for Practical Extraction and Reporting Language (or as Perl's creator and other aficionados sometimes claim: Pathologically Eclectic Rubbish Lister), is one of the most powerful and popular programming languages.

Perl dates back to 1987, when one man, Larry Wall, began developing the language simply as a tool for solving the systems programming problems he encountered as a Unix administrator. Despite its humble beginnings, Perl has grown into a richly featured, complex language.

Perl is appealing because it fills the gap between Unix shell programming and C applications. Perl offers much of the simplicity of the former and the functionality of the latter.

As described by Wall: "Perl is an interpreted language optimized for scanning arbitrary text files, extracting information from those text files and printing reports based on that information. It's also a good language for many system management tasks. The language is intended to be practical (easy to use, efficient and complete) rather than beautiful (tiny, elegant and minimal)."

Wall also points out that Perl's expression syntax corresponds quite closely to C expression syntax; Perl does not arbitrarily limit the size of your data — "if you've got the memory, Perl can slurp in your whole file as a single string;" recursion is of unlimited depth; and Perl uses sophisticated pattern-matching techniques to scan large amounts of data quickly.

Perl, which uses straightforward syntax, data types and structures, is fairly easy to learn. By the same token, well-written Perl programs are usually easy to read and understand.

But that apparent simplicity belies Perl's rich feature set, which includes a built-in symbolic debugger and support for object-oriented programming. A sophisticated data-flow tracing mechanism lets Perl determine if data comes from unsecure sources so potentially dangerous operations can be prevented.

Perl is highly portable, runs on all major and many minor platforms, can access TCP/IP sockets and can be integrated with C. It also offers many specialized extensions for services such as database and X.500 directory access. Topping off the list of benefits are the newsgroups and Web sites galore that provide support and resources for Perl programmers. To an intranet manager, this is implementation nirvana: few constraints, amazing flexibility and lots of support.

As if all this isn't enough, Perl is distributed under the GNU Copyleft license (see www.gnu.org). This means use of Perl is free.

'PERLS' OF WISDOM

Check out the following online resources for more information on Perl.

Resource	URL
The Perl Language Home Page	www.Perl.com/Perl/
The University of Florida Perl Archive	www.cis.ufl.edu/Perl
The Perl programming language – Info, Scripts, Source and Stuff	www.metronet.com/1h/Perlinfo
Perl reference materials	www.eecs,nwu.edu/Perl/Perl.html
Idiot's Guide to Solving Perl CGI Problems	www.Perl.com/Perl/faq/idiots-guide.html

The Perl whirl

Perl scripts or programs, are plain text files converted by the Perl run-time into a byte-code version that allows for error detection and data-flow tracing. The Perl interpreter then converts the byte-code representation to machine code before execution.

As mentioned above, Perl is fairly easy to learn. Most Perl statements end with a semicolon, and many of the statements look like BASIC or C code. For example:

```
# My first program.
print "Hello Word. \n";
```

is, of course, the industry standard first program. It prints to the console. The above code, which we'll store in a file named "hello.pl," is actually a complete Perl script. To run it, we need to invoke the Perl interpreter, thus:

```
Perl hello.pl
```

We can get the same result by entering the following command line:

```
Perl -e 'print "Hello Word. \n";'
```

The "e" flag allows you to execute Perl statements from the command line. Perl offers a number of command-line flags that can control processing options and development features such as the enablement of the debug mode.

Perl is most commonly used as the language for creating back-end applications for Web servers. In the following example, you can see some of the attributes of Perl in a simple application. The application will accept data from an

See Handbook, *page 11*

ASK DR. INTRANET

Please step in and lie down. I understand the stresses and strains felt by network people developing and managing intranets, and I'm here to help. Send your problems to drintranet.@nww.com.

Doctor, users keep complaining that they get broken image icons when they retrieve Web pages from some of our intranet servers. Why is this happening?

Before you do anything, you need to establish how big of a problem you actually have. You can do this by analyzing the log file of each of your Web servers. Some users who see a broken image icon (or BII syndrome as we doctors call it) automatically reload the page.

If you sort the server logs by IP address and then by date and time, you will see that these users are making multiple requests in an attempt to get all the images. The number of users doing multiple reloads will give you an idea of the real scale of the problem and, crucially, what users and Web servers are involved.

The usual cause of broken image icons is dropped packets. If the link from the browser to the server is unreliable, images are usually the component of Web pages that suffer most. This is because they tend to be larger than the text component.

If you find the problems are in the WAN links, it's either time to beat up your service provider or install Web servers at remote locations so users never have to retrieve intranet data over low-quality links. If the problems are on your internal network, look for overloaded routers or other faulty gear.

Doctor, my boss thinks we can build an enterprise intranet using just one big Web server. Is he right?

Sure, in the early phases you might use a single server but keep an eye on that inter-segment traffic. As your intranet traffic grows, your network will start to suffer if all requests are handled by one machine. Indeed, the traffic-loading problem may well cause an outbreak of BII syndrome.

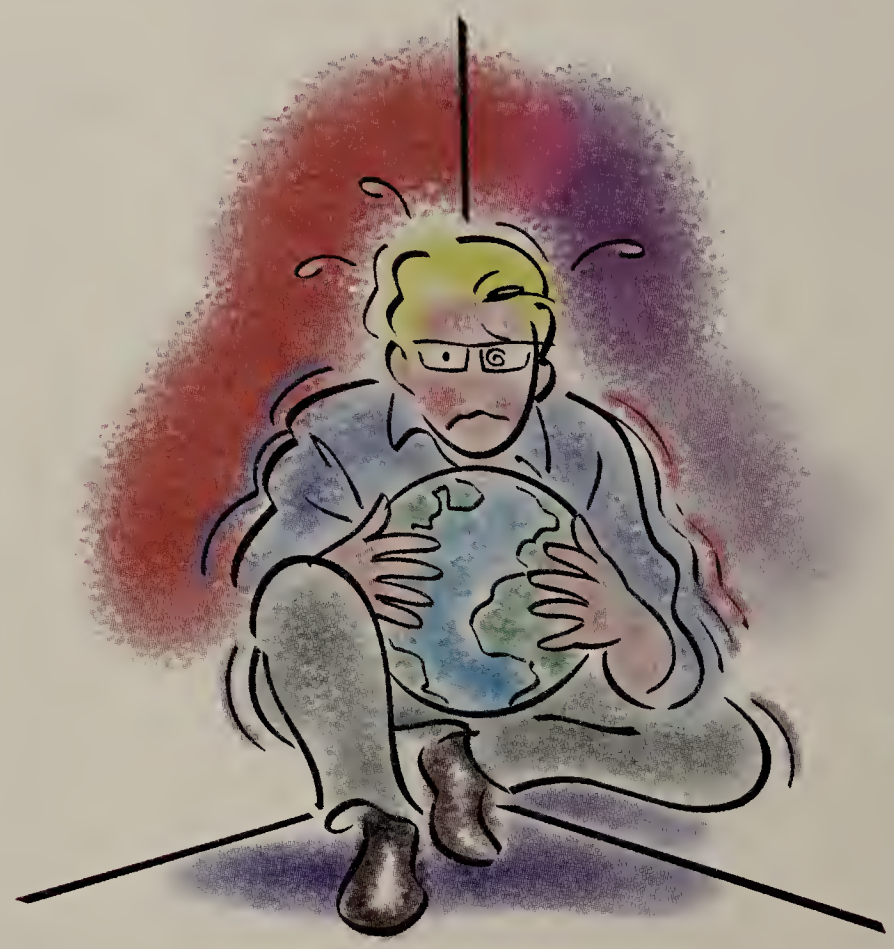
Let your boss live with his fantasy, but be prepared to deploy other Web servers when he finally gives in to the harsh reality of an overloaded network.

Be prepared: Engineer a bidirectional interserver replication scheme. Lotus Development Corp.'s Domino addresses this problem nicely, or there are NT replication, Novell, Inc.'s forthcoming replication solution and the do-it-yourself approach. Ensure replicated intranet documents don't rely on absolute URLs. That way, once a browser is redirected to a different server, the context of the data on that server is correct.

For creating system-level applications in general, and Web server scripts in particular, Perl stands out with its maturity and power.

Perl fills the gap between Unix shell programming and C, offering the simplicity of the former and the functionality of the latter.

Can You Defend Your Internet Resources?



NEW VERSION 2.0

Our Reports Are All You Need!

You worked hard to get your Internet budget, but now the powers that be want to know how it's affecting the bottom line. Sequel Net Access Manager™ can help you find out exactly how your Internet access is being used, and by whom.

Sequel Net Access Manager is the most effective tool to manage and report Internet and intranet usage. It monitors and logs all traffic and service requests so you can review employee activity with the same ease that you review your phone bill.

Our detailed reports let you: determine the ROI on your Internet or intranet expenditures; bill departments based on usage; and "load balance" your network to minimize hardware or telecommunication line charges.

You can even manage access to increase security, productivity and limit legal exposure by assigning or denying access to the Web, FTP, mail, and news–to name a few–on a corporate, group or individual basis.

SeQuel **NET ACCESS MANAGER™**

Sequel Net Access Manager lets you manage Internet and intranet usage, reconcile costs with detailed reports, limit legal exposure and increase network security.

Sequel Net Access Manager is even designed to minimize the administrative burden on IS. Set up is a breeze. Departmental managers can be assigned to manage individual access privileges and maintain site control lists.

Sequel Net Access Manager is a server based application and is available for Microsoft Windows NT™ Server 3.51 and 4.0 and Microsoft SQL Server 6.0 and 6.5. The Sequel Net Access Manager Client Administrator can be installed on Microsoft Windows 95 or Microsoft Windows NT Workstation 3.51 or 4.0.

BEST OF BYTE COMDEX Fall '96 FINALIST

Data Communications LAN Times BEST OF SHOW 96 FINALIST

"If you're a network manager or executive who wants to understand Internet-usage patterns or to block access to certain Web sites, take a good look at Net Access Manager."

Windows Sources, November 1996

DOWNLOAD YOUR FREE EVALUATION COPY TODAY:

www.sequeltech.com

For more information, call:

1-800-973-7835 ext. 5353

SEQUEL™

SEND FOR YOUR FREE EXIDE ELECTRONICS CATALOG.

For even faster service, call us at 1-800-554-3448, ext. 767, or complete and fax this card to 1-800-75-EXIDE.

Or visit us on the Internet at http://www.exide.com, or E-mail us at info@exide.com

☑ Yes! Please send me more information on Exide Electronics' lineup of power management solutions.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ ZIP _____

Telephone ( ) _____

Fax ( ) _____ E-mail _____

BRMNWR Cor02FYA

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 2652 RALEIGH NC

POSTAGE WILL BE PAID BY ADDRESSEE

EXIDE ELECTRONICS
5608 SPRING CT
RALEIGH NC 27690-0457

Handbook, *continued from page 9*

HTML form and return the form data to the browser as an HTML page. (The line numbering isn't part of Perl; it's for reference.)

```
1   # A (very) simple Web server script.
2   #
3   #!/usr/local/bin/Perl
4   if ($ENV{'REQUEST_METHOD'} eq
    "GET") {
5   $FORM_DATA =
     $ENV{'QUERY_STRING'};
6    } else {
7    $LENGTH = $ENV
    {'CONTENT_LENGTH'};
8    while ($LENGTH) {
9       $FORM_DATA .= getc(STDIN);
10       $LENGTH--;
11      }
12   }
13  print "Content-type: text/html\n\n";
14  print "REQUEST_METHOD:
    $ENV{'REQUEST_METHOD'}<BR>\n";
15  print "CONTENT_LENGTH:
    $ENV{'CONTENT_LENGTH'}<BR>\n";
16  print "QUERY_STRING:
    $ENV{'QUERY_STRING'}<BR>\n";
17  print "<HR>\n";
18  print "FORM_DATA: $FORM_DATA\n";
```

The first two lines are comments, as denoted by the hash symbols. The third line is specific to Unix environments in which the script is invoked by its name only — the Unix shell needs to be told where to find the Perl interpreter. The "#!" construct tells the operating system where to find the executable to handle this script.

The fourth line shows off one of Perl's internal variables. "$ENV" lets you retrieve the value of environment variables. Perl has an extensive range of these special variables.

"$FORM_DATA" (first used on Line 5) is a user-defined variable. If the method used to pass data to the Web application is "GET," the argument is retrieved from the environment variable named "QUERY_STRING" (constructed on the fly by the Web server) and stored in "$FORM_DATA" (again on Line 5).

If the method is not "GET," then we assume it is "POST" and get the data from the Web application's standard input. First, the number of characters to read is retrieved from "CONTENT_LENGTH," another Web-server-created environment variable (see Line 7).

Then we use a while loop for that number of characters and Perl's "getc" function to read the data from the standard input into the "$FORM_DATA" variable (Lines 8 through 11). Perl also supports all of the other expected control structures such as until, do-while, do-until, and unless.

For simplicity's sake, in this example we didn't check if "CONTENT_LENGTH" is less than some expected maximum number of characters, but we would in actuality. While a ridiculous number of characters is unlikely to cause Perl to behave in an unexpected way, the load on the server from trying to read, say, one billion characters, could cause performance problems.

All of the output, including the partial HTTP header (Line 13), is generated by printing to the standard output.

While this is a trivial Web server application, it is fully functional and could be used as the skeleton for a far more sophisticated purpose, such as an HTML form handler. That's the beauty of Perl: It can handle the smallest of problems, as well as effectively tackle the big ones.

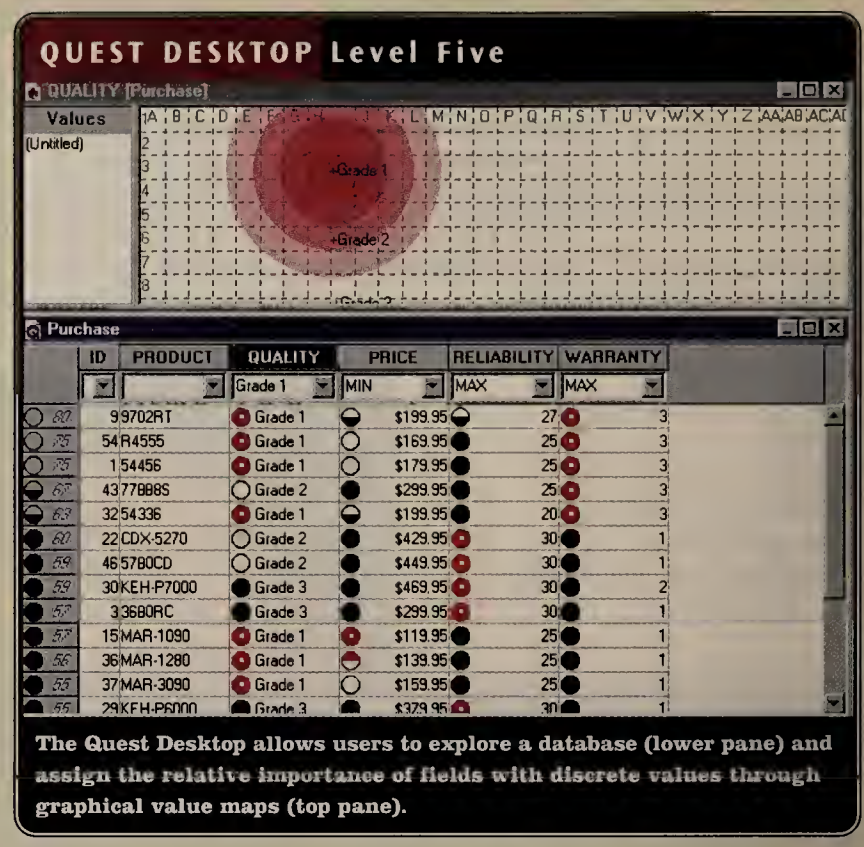
Perl is steadily evolving. Implementations are available for a tremendous range of platforms such as Application System/400, Macintosh, MS DOS, MVS, NetWare, OS/2, Unix, VMS and Windows 3.1, 95 and NT, as well as support for Microsoft Corp.'s Internet Server API. A compiler is in alpha release (see users.ox.ac.uk/ttie/perl.html).

Perl is a uniquely rich programming environment with an enthusiastic following and a lot of supporting software. It is a prime tool for intranets.

Level Five's Quest 2.5:

A unique data mining tool

BY MARK GIBBS



The Quest Desktop allows users to explore a database (lower pane) and assign the relative importance of fields with discrete values through graphical value maps (top pane).

The idea of data mining on intranets is taking on star status. And if the data mining field had the equivalent of the Academy Awards, Level Five Research, Inc.'s Quest Version 2.5 would be nominated for best supporting tool.

An intranet is first and foremost a generalized data collection and distribution system. But how do users find what they want in the collection of data? While general-purpose searching is available in any industrial-strength database product, there haven't been many choices for making decisions based on how well the data fit specific criteria.

This is an area in an intranet environment to which Level Five's Quest Server, a back-end Web server application, brings tremendous value.

The Quest system comprises the Quest Desktop, which IT staffers and savvy users can employ for data mining and Web content construction; and the Quest Server, which provides sophisticated intranet search facilities through a Web server.

Installation is straightforward. The Quest system comes with its own Web server or can be installed on a number of popular Web servers. I recommend the latter option for a production environment.

Here's a an example of how Quest Desktop and Quest Server, a Common Gateway Interface application, might be used on an intranet.

Consider a company that has a vendor- and product-tracking system using a database that complies with Microsoft Corp.'s Open Database Connectivity (ODBC). In addition to using an ODBC-compliant database, the IT staff has developed Web server scripts that accept input and updates from Web browser forms. The problems IT faces now are making the system accessible via the intranet and allowing users to decide which vendors provide the best combination of price and reliability.

Prepare for stardom

To prepare the database for publishing on a Web server, we start with the Quest Desktop and create a new project — a collection of control files used to define and manage access to a specific database. The Connection Wizard leads us through the selection of data source, database driver, target database, the table or view in it, and finally the columns we want to use.

In this example, we use the sales database and from the table select the record number, product code, quality, price, reliability and warranty fields. We are then presented with a table of our data.

In the fields beneath each column header, we can enter target values for which we want to allow searching. If we enter "MAX" in the value field of, say, the Reliability column, the table will be sorted with the highest value at the top.

Quest Desktop allows the relative score of each cell in a column to be displayed in the cell. Grading icons make the ranking of values more visual.

We also can factor in the quality measure. We need to assign relative importance to text strings, such as "Grade 1" and "Grade 2," if our quality measure uses phrases rather than numbers. Quest supports this through value maps.

To refine our criteria even further, we can assign relative importance to the column for which we have set target values and value maps. If our primary concerns are reliability and quality, for example, we could adjust their weights to each other and to price.

It's show time!

We now need to make the project files available to our Web server so when the Quest Server is invoked, the database and ranking criteria are available. Level Five provides a Web Publishing Wizard that allows direct links from the Quest Desktop to the target Web server so the project can be uploaded. However, the upload only applies to project data. The database itself and other project components — images, applets and so on — have to be transferred by other means, such as File Transfer Protocol.

The default presentation of the data at the browser is a table with the database fields listed as column headings. Below each heading is an entry field for setting the target value and another for assigning the importance of the field.

Using the Quest Desktop, we can control whether the target and importance fields for a given database field are displayed through Quest Server. This is important for fields that are not intended to be part of the search criteria but are required for display purposes.

When we set the target values and importance of one or more fields and click on the Quest! button, the database is reordered and returned to the browser. If we disable automatic searching (the default state), the first time the user retrieves a project the records in the database will not be displayed.

This is useful because simply presenting the field names, target values and importance means users won't be distracted by the unranked data. With Quest, we also can specify "HTML wrappers" to create headers and footers for the pages so we can add instructions and graphics.

It also is possible to drive the search specification from an HTML form, instead of the default table display, so we can improve the look and feel of the user interface. What's more, URLs can be built into the results.

A star is born

I've only scratched the surface of Quest, but little in this release presents any drawbacks for intranet developers.

Level Five stands out for the multimedia training it includes with the Quest system. The company uses 11 Lotus Development Corp. ScreenCam presentations with a 66-minute run-time to cover basic information and advanced topics related to Quest Desktop and Quest Server.

For a product with the richness of Quest, these tutorials make a huge difference in how fast a user can learn the system. The paper manuals are adequate, though somewhat repetitious.

I am impressed with the Quest products, as they provide sophisticated, flexible, user-friendly database mining in an intranet environment.

PRODUCT CAPSULE

- **Name:** Quest
- **Current release:** 2.5
- **Price:** $499
- **Requirements:** For Quest Server: Windows 95 or Windows NT 3.51 or 4.0, 80486 processor or better, 16M bytes of RAM, 18M bytes of disk space; for Quest Desktop: Windows 3.11, Windows 95 or Windows NT 3.51 or 4.0, 80486 processor or better, 8M bytes of RAM, 7M bytes of disk space, sound card (for tutorials).
- **Vendor:** Level Five Research, Inc., Melbourne, Fla.
- **Contact information:**
  Phone: (407) 984-8705
  Web: www.l5r.com

PROS AND CONS Level Five's Quest

Pros

- Offers good performance and low processor and disk space use.
- Is an effective product that generates a data mining environment suitable for most users.

Cons

- The paper documentation needs improvement.
- Has a complex disk subdirectory layout that isn't well documented.
- The CGI-only implementation limits maximum performance.

SUMMARY: This is a well-engineered data mining solution with good performance and a rich feature set that is unique in the market.

RATING

Value for money	5
Intranet usefulness	5
Quality	4
Overall	4.7

1 is poor and 5 is excellent

MAINFRAME-TO-WEB. EXTENDING YOUR INTRANET.

It's not as big a leap as you think.

In fact, linking your mainframe to the Web is an easy jump with Attachmate.® Because for 15 years, we've been connecting more TCP/IP and SNA desktops to host systems than anyone else.

Now Attachmate extends your Intranets with two powerful software solutions. First, you can link legacy applications – relational databases and all – to any Web server with our EXTRA!® Host Publishing System. And second, meet all of your needs for host and Internet desktop connectivity with EXTRA! Personal Client, the industry's number one selling multi-host solution for Windows NT® 4.0.

Our world class customer support and consulting services make your jump to an Intranet even easier. Just call Attachmate at **1-800-426-6283** or **206-644-4010** (mention response code 634.00). For an on-line demo and the white paper, "The Change Drivers, a Perspective on the Transformation of Enterprise Computing," go to:

www.attachmate.com/ad/NW1.htm

PCWEEK LABS ANALYST'S CHOICE

ent Readers Choice Awards 1996 WINNER

BEST OF BYTE PC EXPO '96

LAN TIMES READERS' CHOICE 1996

ATTACHMATE EXTRA!

EXTRA!® Personal Client
Industry's only 16/32-bit Windows® multi-host access, Netscape®/Microsoft® Web browsing, TCP/IP and NFS™ suite, and software management solution all in one.

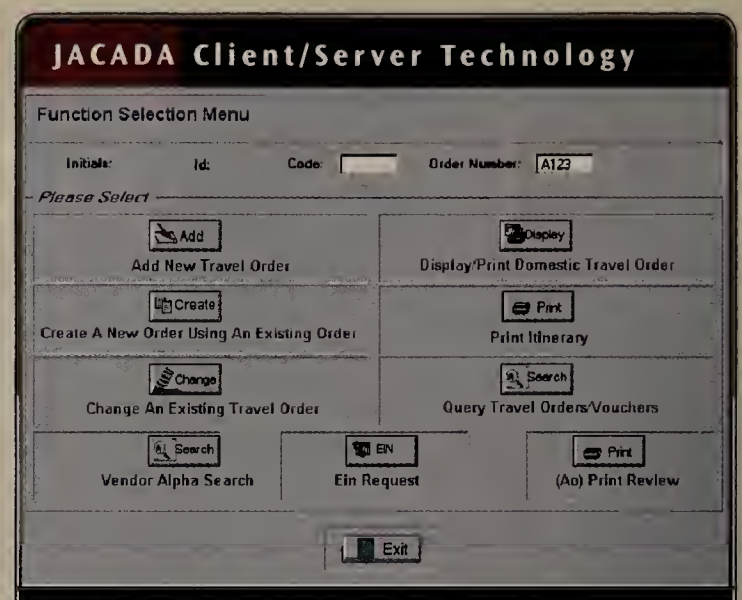
ATTACHMATE EXTRA!

EXTRA! Host Publishing System
Powerful, yet simple Windows/ ActiveX™ development system that links 3270 applications and relational databases to the Web, viewable by any Web browser.

Attachmate™

Mainframe data goes graphical on the Web

BY PEGGY WATT



Jacada re-creates data from text-based host screens as a graphical Java applet with a browser interface.

Web time has its obvious downside: It's nearly impossible to keep completely up-to-date. But the big advantage of this accelerated development and deployment is that the next (improved) generation arrives much faster.

Even host systems, which — let's face it — haven't changed much in decades, are getting a big boost from the Web. Every week, it seems, another development kit or conversion tool for providing browser-based graphical access to host systems is introduced.

Legacy Links

"Web-to-host connectivity is a hot market," says Lucinda Borovick, an analyst with the market research firm International Data Corp. in Framingham, Mass. She estimates the Web-to-host market is at $5 million today, but expects it to hit $1 billion in 2001. Most of the action, she says, will be for intranets.

The market isn't only growing, it's maturing. The first products in this arena provided basic graphical display of host data. The next batch let users view the mainframe via a browser. Now legacy access products use Web languages, namely Java, to deliver host data to the client.

A pioneer on this front is Client/Server Technology, Ltd. (CST), an Atlanta company that has been supplying a variety of tools to generate graphical client screens for host-based applications since 1990.

SELECTED LEGACY LINK PRODUCTS

COMPANY	URL	PRODUCT	PRICING
Apertus	www.apertus.com	Enterprise/Access: Web Edition	$20,000
Attachmate	www.attachmate.com	Emissary Host Publishing System	$25,000
Client/Server Technology	www.cst.com	Jacada	$20,000 for a 40-user license; $17,000 for the software development kit
OpenConnect Systems	www.oc.com	OC://WebConnect 2.5	$319 per session, depending on number of users
Persoft	www.persoft.com	Persona Insight	$445 per concurrent session
Simware	www.simware.com	Salvo 3.5	$4,950 for 10 concurrent users
Teubner & Associates	www.teubner.com	Corridor 2.0	$6,000 per concurrent user

CST's newest entry is Jacada, introduced last month at Internet Expo in San Jose, Calif., Jacada resides on a host or a Web server and generates Java applets that enable clients to access mainframe and mid-range data, without changing the existing host application.

The new product uses the same KnowledgeBase technology CST uses in its other host connectivity programs. The KnowledgeBase translates 5250 and 3270 terminal datastreams to Java code, which is delivered to the user's desktop as a Java applet. The client screen resembles the user's browser interface, but a Java applet is actually running, not the desktop-based browser.

"Our whole intent with KnowledgeBase is to add delivery platforms so users can integrate with host applications they already have," says David Holmes, CST's vice president of marketing. The company also may develop a version that converts host applications to ActiveX, he says.

Under Jacada, host applications run as usual, generating data for PCs emulating 5250 or 3270 terminals. Client access to the host can be routed through a Web server, as many intranets are configured to link with legacy systems. The server simply activates Jacada to set up a synchronous connection and download the Java applet. Because the applet executes entirely on the user's client system, the Web server may be a conduit but is not a participant in the process and, therefore, not a bottleneck, Holmes says.

Java's capability to run on any platform was an enticing selling point for Jacada, according to a team of beta testers at a federal agency, which asked not to be named.

The agency's IT department supports some 8,000 users around the country running a variety of desktop systems, including Windows and Macintosh.

"Every desktop was just different enough to require a unique installation" for most host connectivity programs, the project leader says. While most of the organization's desktops have browsers, the technicians found some inconsistencies in the way different browsers handle HTML code. This discouraged them from adopting one of the more common host-to-HTML conversion programs.

When using Jacada, it's best to ensure that every browser supports Java. But users also can run downloadable browsers when they access the Jacada application, the technicians say.

The department prototyped its mainframe-based travel management application in Jacada. The KnowledgeBase was used to review the host screens and generate graphical elements such as radio buttons and list boxes from the green 3270 screens, IT staffers say.

The resulting input screens are cleaner and easier to navigate, team members say. For example, a purchase order at the agency contains as many as 90 line items, and users running 3270 emulation had to manually page down dozens of screens to get to the lines they needed. Jacada converted the application to a graphical presentation that supported click-and-jump operations. The application also overlapped related screens graphically, and provided tabs for users to click and move among screens.

"It's just a better presentation," the project leader says. "We could group more common information logically and navigate more easily." Application changes are made as before on the 3270 system, and then brought forward through the KnowledgeBase to the Java applet.

"The beauty is that you can use host-based data stored anywhere in the department's database," says a team technician. The travel system is only one of approximately 100 subsystems in the organization's administrative database, which involves about 800 host screens. "If you had to go through each screen individually, that would take too much time," he says. But this conversion method is feasible.

The team also was pleased with the speed of development. The proof of concept took only about 10 days to set up and test, and the team expects to deploy the application within a month.

Jacada supports Windows NT and Windows 95 Web servers; CST has committed to developing versions for Application System/400 and Unix server platforms.

Legacy connectivity is a logical and welcome application for Java technology, says Daryl Plummer, research director for Gartner Group, Inc.'s Applications Development, Management Tools and Technology business in Atlanta.

"This wave of Java applets has been a playground for developers, where they build fun graphics like barking dogs, and you had to wonder when it would get serious," Plummer says.

Some Web-to-host systems link directly to the mainframe data, while others re-create the data graphically.

Web servers do not have sessions like host systems. This makes updating data in real time more challenging.

Believe it.

EcoSCOPE

The truth about your networked applications.

Imagine. A network where everything is visible. Where you can see an applications view of network performance. Where you can identify application response time during specific time intervals. Where you can determine which application transactions are using critical bandwidth. And discover, measure and track application traffic enterprise-wide. The truth is now here. EcoSCOPE 3.0, the truth about your networked applications. To experience EcoSCOPE, visit our web site. Once you see it, you will believe.

w w w . c o m p u w a r e . c o m / e c o s c o p e

1-800-368-4326

COMPUWARE

Circle Reader Service #1

He calls Jacada an example of "legacy extension" technology because the back-end systems are still doing the work.

By bypassing the Web server, Plummer says, CST avoids potential communications problems that can occur because the Web server doesn't support sessions. When users connect via a Web server, the mainframe can't identify a user or get state emulation as it can when accessed by an emulation program. Consequently, getting mainframe screens by converting them to HTML via a Web server can be a bottleneck, Plummer says.

Nonetheless, HTML conversion is the hallmark of many existing browser-to-host connectivity programs.

CST, however, is not alone in pursuing next-generation solutions that involve the new Web languages.

Persoft, Inc., a Madison, Wis., developer of host connectivity products, for example, also has announced a Java-fueled approach to host communications. The product, called Persona Insight, will run on the server and download a platform-independent Java applet that provides the host data in a graphical format. It will require users to have Java-aware browsers.

And Simware, Inc. of Ottawa last month released Salvo 3.5, a server-based program that also provides 3270 and 5250 emulation by generating HTML code. With the newest version of the product, IT developers can customize Salvo applications by using JScript, Microsoft Corp.'s implementation of JavaScript, as well as VBScript (the Visual Basic scripting language) and REXX, a mainframe scripting language.

Salvo integrates with the API of Microsoft's Internet Information Server and Netscape Communications Corp.'s Communications Server, so developers can take advantage of the security built into the Web servers.

Salvo's key difference from other Web-to-host programs is its server-centric approach, says Chris Fedorko, Simware's vice president of marketing. Simware took this route to avoid the desktop platform demands that hampered many client/server configurations, Fedorko says.

"There are still a lot of 386 and 486 desktops in corporations today," he adds. "Salvo will work with any platform that has a browser."

Salvo has several layers of information management tools, and developers can reuse components of the layers as they identify data sources for Web browser access.

Also new in Salvo 3.5 is an API tool kit that provides additional links to common data sources, such as Open Database Connectivity, VT100 and VT220. Salvo 3.5 supports Digital Equipment Corp.'s RISC-based Alpha servers, as well as the Intel Corp.-based platforms Salvo previously supported.

The product's ability to accommodate several platforms and migrate across them easily is appealing to companies supporting different environments at the client and server ends, says Harry Paddock, senior information systems analyst with San Francisco-based Pacific Gas & Electric Co., which has been evaluating Salvo.

Because Salvo's new object development environment supports reusable code, IT developers could more quickly deploy an application on several platforms.

Support for Visual Basic and JavaScript will be useful when the utility company does more custom interface design, but for now, the priority for legacy access is easy data retrieval and deployment in a graphical environment, Paddock says.

"We wanted a more open systems approach to widely distribute our mainframe applications, and that friendlier look and feel is becoming required," Paddock says. "3270 emulation is not friendly, and it's not what users want anymore. An object environment allows me to extend the functionality of our 3270-based applications to present new combinations of data without expensive rewrites on the mainframe."

Architectural Marvels or Monstrosities?

A builder's guide on how to avoid some common intranet design faux pas.

BY PEGGY WATT

bizarre example of American architecture sits amid the chip-makers and software wizards in Silicon Valley. The Winchester Mystery House, named for its designer, the superstitious Sarah Winchester, is a labyrinth of trick passages, doors that lead to walls, stairs that end at ceilings and other bewildering elements of design.

Winchester's reason for nearly 40 years of mangled construction was her belief that the maze would protect her from the revenge-seeking ghosts of people who died from shots fired by a Winchester Repeating rifle, her husband's invention and her frightening legacy.

Shel Holtz, principal of the consulting firm Holtz Communication & Technology in Concord, Calif., says constant development and tweaking of intranets can result in the electronic equivalent of the Winchester Mystery House. "That monstrosity isn't what it started out as, either."

Like Winchester, who grew an eight-room farmhouse into a 160-room structural horror, the intranet architect rarely starts out from scratch. The fact is, the most challenging task isn't usually to architect, but to re-architect.

"Sometimes you're stuck with the architecture you had when you started sharing information," even before the first internal Web server appeared, Holtz says. That means integrating a corporate Web with a LAN or three, and accommodating file and application servers, an E-mail system and probably a few renegade Web servers run by eager workgroups. Before too many of those "unofficial" Web servers go online, it's time to draw up virtual blueprints.

"When the intranet evolves beyond the point of being a project, and the company makes a business case for doing something with the technology, then you can monkey with the architecture," Holtz says.

When a corporation commits to building a mission-critical intranet, that's usually when IT gets involved, and the intranet designers get a budget and the green light to make changes to the infrastructure.

Take a cue from Winchester: Keep your goal in mind.

"We're not talking bandwidth and packets, but timeliness and productivity," Holtz says. "Looking at the intranet architecture from the view of its content and objectives provides an opportunity to make it more of an asset to the organization."

Issues to consider include: What kinds of business activities will take place online? Which corporate databases will users want to browse? Will users edit documents simultaneously, whiteboard style, or just search out static files? Do users want to plug Web links into corporate E-mail? Should the whole E-mail system be overhauled, too?

"The intranet architecture has to look first at functionality, at what I am trying to accomplish, and then at the mechanism," says Kevin Tolly, president of The Tolly Group, a Manasquan, N.J., consulting firm.

Experienced intranet builders have their own checklists, but they share basic elements: Take inventory. Consider hardware and software needs. Think about the content (the reason for the intranet, after all). Prototype if you can. Choose standards. Build. Try it out. Go back and take inventory again and, like Winchester, resign yourself to keep building.

"I think it takes three generations of builds — not including prototyping — to get things right," Tolly says. If an intranet is successful, it will grow. And even if the plan calls for growth, some re-architecting is a given.

But don't be daunted. Tolly emphasizes that because few intranets start with a blank slate, designers need to be able to make good use of existing infrastructure. His staff follows the same policies as with other important corporate technology. For example, architects should consider issues of security, backup, access loads and maintenance to determine server placement on a network, and even the choice of server.

Tolly suggests first assessing the network operating system (NOS) to determine which tasks it shoulders and which it

Apply basic capacity planning principles when building an intranet, advises Michael Josephs, an executive director with Concept Five Technologies.

PHOTO BY WALTER P CALLAHAN, BACKGROUND COURTESY OF WINCHESTER MYSTERY HOUSE

shares with a Web server. Microsoft Corp.'s Internet Information Server, for example, relies on the Windows NT operating system for most of its security features, a setup that might be sufficient for a strictly internal access intranet. O'Reilly & Associates, Inc.'s WebSite, on the other hand, provides complementary, decoupled security functions, a setup that might be preferable if outsiders will be accessing some intranet pages, Tolly says.

What's more, some Web servers provide their own diagnostics and log files in addition to those supplied by the NOS; the network manager needs to decide which to watch. Intranets should leverage the strengths of the existing architecture, Tolly says.

Placing Web servers presents the same challenge as locating most servers, Tolly says. "There's always a trade-off," he notes. "Do you keep the servers closer to the user to try to optimize performance, or do you try to cluster them to reduce the cost of management?"

Existing equipment can help an architect decide on server placement. For example, the intranet designer could take advantage of LAN switches to relieve the performance drag that sometimes occurs when clustered servers compete for bandwidth.

Consider primarily the size of the organization and its existing architecture when placing servers, suggests John Meyer, director of technology with Lante Corp., a Chicago-based consulting firm. Web pages are highly graphical and graphics are bottlenecks, even inside the firewall, Meyer says.

"Web sites definitely have an impact on a network, and especially if information is of a timely nature, accessed frequently, the architecture needs to be able to handle demand," Meyer says. He suggests large loads be distributed across several servers so transmission times (and users) don't suffer.

Consider what's online and how it will be used to determine where it should reside, suggests Rob Laws, a senior training specialist in Microsoft's desktop and business systems division, who helps maintain the software company's humongous intranet.

"Microsoft has thirty or forty thousand servers and hundreds of thousands of documents, including legacy data with nondescript file names," Laws says. He labels this map of information "document storage" because the files are essentially static and infrequently accessed. These documents may eventually be accessible by browsers, but those archive files are a lower priority for Web integration.

In contrast, the material Laws calls "information storage" is dynamic, frequently accessed and should be easily accessible by browsers and search engines. Usually, such files are stored so they can be accessed through an internal Web site that draws from an SQL database.

"I don't find that having a central location is an end-all," Laws says. "Distributed data sometimes makes more sense. You can do nightly backups. Servers do go down, so having all data go through one server sometimes sets you up for failure."

Through the easy magic of links, databases can be virtually anywhere on the network, Laws adds. Move them later if necessary.

NetworkWorld
TECHNICAL SEMINARS

Learn from internetworking expert Scott Bradner

Don't Miss It!

Fast LAN SOLUTIONS

Technologies and Applications

Technologies to Solve Today's LAN Challenges

Today's local data networks are in a period of rapid transition. They are moving from an environment designed to support simple, best-effort client/server and remote resource access applications to one that includes far greater traffic. This new class of network-based applications requires high reliability and real-time performance guarantees while at the same time operating under tremendous pressure to minimize cost of ownership.

At one point the transition path looked clear. It seemed widely accepted that ATM would meet bandwidth demands and serve the local and wide area networks of the future. Now, the advent of fast LAN technologies such as switched Ethernet and token ring LANs, along with 100 Mb and soon, Gigabit Ethernet, challenges conventional wisdom. The picture is made more confusing by the existing FDDI technology and belatedly, cost-effective, standards-based ATM.

Fast LAN Solutions: Technologies and Applications, taught by internetworking expert Scott Bradner, will prepare you to successfully manage these new demands on LAN design. This information-packed one-day seminar will help you evaluate each of the technologies vying to replace existing Ethernet and token ring networks. Mr. Bradner will also guide you through a new maze of decisions by examining the place of virtual LANs and the changing role of routers and routing in the networks of tomorrow. Through information-rich case studies the presenter will highlight real-world fast LAN solutions for you to consider in your own LAN design.

Attend Fast LAN Solutions and make the right decisions for the future of your network today!

10 Key Benefits of Attending . . .

1. **Understand the impact of advanced applications on LAN requirements**
2. **Explore today's fast LAN technology marketplace**
3. **Analyze the cost of ownership for each fast LAN technology**
4. **Learn the management differences between fast LANs and traditional LANs**
5. **Explore sample LAN designs for each fast LAN technology**
6. **Evaluate different vendors' fast LAN device offerings**
7. **Explore ways to increase the security of fast LAN networks**
8. **Discover the future role of routers and routing in your LAN**
9. **Learn how to use the RMON capabilities common in fast LAN devices**
10. **Prepare a detailed comparison between various LAN technologies**

1997 LOCATIONS AND DATES

Chicago, IL	**Feb. 26**	Minneapolis, MN	**Mar. 26**
Dallas, TX	**Feb. 27**	Irvine, CA	**Apr. 14**
Washington, DC	**Mar. 3**	San Francisco, CA	**Apr. 15**
Boston, MA	**Mar. 19**	New York, NY	**Apr. 23**
Philadelphia, PA	**Mar. 25**	Atlanta, GA	**Apr. 24**

If you are interested in sponsorship opportunities, please call 508/820-7520.

REGISTER AND YOU WILL RECEIVE . . .

- Comprehensive seminar workbook
- Exclusive Fast LAN Solutions resource guide
- Luncheon and break refreshments
- All of the above included in your $450 registration fee

Note: If you can't attend, call us and order this informative and useful attendee materials kit for just $99.95!

Dial Our **FAX-BACK** Information Line at
1-800-756-9430
for a complete seminar outline and registration form.
When prompted, request document #20.

Call 1-800-643-4668
Register today for the seminar nearest you!

Web/E-Mail Information
Obtain full seminar information and register on-line in the Professional Development section on our Web site at:
www.nwfusion.com
OR
receive full seminar information via e-mail by sending a request to:
seminars@nwfusion.com
Please put the word "FAST" in the subject field.

Sponsored by:
Cisco Systems · intel · NEWBRIDGE · PACKET ENGINES · ACACIA NETWORKS Fast, Adaptive Switching

Where's the data?

Access to existing databases is part of most intranets, but it doesn't have to be a challenge.

"It doesn't really matter where the database sits," says Michael Josephs, executive director of products and services for Concept Five Technologies, Inc., a McLean, Va., consulting organization. "If it's corporate critical data, you probably want it under the auspices of the IT group to maintain security and administration, and those jobs aren't for novices. Otherwise, apply basic capacity planning."

One reason the physical database doesn't matter is that users probably won't be accessing the original repository, anyway. An ever-widening selection of integration tools will move legacy data to an SQL database or, at least, to a cache that users then access by browsing a Web page.

"If you're running a database that can be accessed relationally, and your Web server is on Windows NT, your database could be coresident, on a different Windows NT machine or even on an AS/400 or a mainframe," Tolly says. It's simple to extend a Web server so HTML can support SQL statements. What's more, users don't need to worry which database contains the information; they just submit queries.

Most intranet architects recommend replicating databases on the same server as the Web server software and giving users access to that data. This arrangement, they say, not only protects original data but also speeds retrieval.

"If it's a read-only database, it's better to replicate it over to a Web server and update it nightly," Tolly says. "We won't put our live database online

AS EASY AS 1,2,3?

When it comes to designing and constructing an intranet, think in phases, says Michael Josephs, executive director of products and services for Concept Five Technologies, Inc., a McLean, Va., consulting organization. Here are his recommendations.

PHASE 1: Service definitions

- **Set some baselines. What is your technology? Who are your users? Where is the data? What kind of information will go in your intranet, and who will manage it?**
- **Define the hierarchy and determine who needs to know what. This inevitably identifies redundancy of records in an organization. Establish a "gold standard" for data — designate that source as the official source.**

PHASE 2: Pilot

- **Examine the content. Who supplies it? Make the intranet a team project. Show off the good stuff as soon as possible.**
- **Pattern your intranet after the Internet: The 'Net doesn't have rollouts; new stuff just appears and surfers find it. Create that same sort of excitement with your intranet. Give your test group the URL and see how fast its use spreads.**

PHASE 3: Deployment

- **No big bugs at this point, please. One day, change the pointer from the developmental server to the production server.**
- **Use intranet tools, such as chat rooms, to promote the value of the corporate Web. Encourage people to look at old (even distasteful) tasks in new ways. Let everyone deal with IT through newsgroups, for example. Create new habits.**

because there's no benefit, but there's always a chance of corruption."

Use existing support

Another obvious early necessity is TCP/IP support.

If you don't have TCP/IP, you face significant rollout issues because the TCP/IP must go in first, before anything else can be done. Even if a TCP/IP infrastructure is in place, an organization faces other issues about deploying it universally.

For example, a company has to figure out if a laptop user should have a static or dynamic IP address. Microsoft and Novell, Inc. are developing tools so their NOSes will better handle IP addresses that are assigned on the fly by the server, but most systems currently work best with a consistent address.

Once TCP/IP is in, leverage it, the veterans say. "The more parts of your company that are already set up with IP addresses and have browsers, the sooner people can get started," says Concept Five's Josephs.

And make sure you build a prototype — even if a few Web servers are already operating, experienced architects insist. In fact, Tolly says, prototype each time you make significant changes in your intranet, such as adding Web-based access to a different type of database.

Tolly recommends that organizations make a pilot installation of Web servers and applications and run the servers for a while apart from the production system that is in daily use. And, when the architecture of some mission-critical application changes, run parallel systems until it's clear that the new system is stable. "You have to prototype as you architect," Tolly says.

Once the intranet is running, look again to Winchester. Prepare to build again. Growth often requires re-architecting, no matter how careful the blueprints.

"Web sites get very large very quickly, and if the infrastructure is not well laid out, the care and feeding costs, the maintenance, gets very, very high," Tolly says. "I think most people think of re-architecting in terms of presentation, giving the system a facelift. But there are system configuration issues that must be addressed."

Test, test, test — as much as time and circumstances permit.

"The danger is that stuff always falls through the cracks, such as CGI [Common Gateway Interface] scripts that make calls to stuff that's not there anymore," Holtz says.

Try, and try again

And it's almost a given that nobody gets it quite right the first time, Tolly adds. "I don't know that it's even possible yet for anybody to build a first-class intranet without having built a third- and second-class intranet first," he explains. "It's not like building housing, which has well-established rules and practices and lots of references."

Ken Ouchi, chief information officer of Solectron Corp., a Milpitas, Calif., electronics components manufacturer, heeds this kind of advice. Ouchi has built re-architecting into his construction plan, which he considers still in the early stages. The intranet will eventually serve more than 2,000 users, and he expects the architecture and implementation will change along with technology and people's usage.

"Our intranet functions are highly plastic and can be formed to fit and evolve," Ouchi says. "People and their ability to absorb technology have the greatest impact on what really happens as we begin implementation."

And re-architecting encourages a reality check.

"As long as you're changing it, here's the chance to get feedback from the users and enhance what the intranet does, rather than what it is," Holtz says. "I always come back to bottom-line productivity issues."

Keep the goal in mind — even if it's something like scaring off ghosts.

INTRANET

We asked the experts at USWeb Utopia to redesign Acxiom Corp.'s internal Web, revealing in the process what makes an intranet tick.

BY PATRICIA O'HERN

As young as they are, many intranets are already in need of an overhaul.

This is typically a byproduct of changing expectations — companies ratcheting up their goals as experience grows — or insufficient planning up front. There are tales aplenty of companies that underestimated the power of the tool, only to have to go back and do it all over again when they recognized the strategic implications.

To gain some insight into the redesign process and the potential benefits, we asked USWeb Utopia, a Web consulting firm, to evaluate the intranet of a willing victim, Acxiom Corp., a large database marketing company headquartered in Conway, Ark.

A good redesign, says Patricia O'Hern, director of intranet consulting at USWeb Utopia, focuses on the logical organization and flow of information, not just prettying individual pages. USWeb Utopia identified five problems with Acxiom's current site and, based on that, suggested a new organizational structure and even dummied up a few new pages.

Evaluation of AcxInet

Acxiom, a provider of information services and products that allow businesses to make informed marketing, merchandising and risk management decisions, implemented its intranet, AcxInet, in May 1995.

The network has since undergone four facelifts, with the objective of moving the content up front and restructuring the available information. In its current configuration, the site is content-rich, with more than 5,000 pages, but still underutilized by associates (Acxiom's term for employees). Associate Chris Tackett, who handled much of the original design and architecture of AcxInet, says he sees the underutilization as a symptom that AcxInet is not meeting its business objectives.

Before I began my evaluation of AcxInet, I discussed those objectives with Roseann Allen, the technical manager responsible for implementing AcxInet. It turns out the intranet has the same goals as the corporation: AcxInet should be a tool to help Acxiom maximize customer satisfaction, enhance associate satisfaction and increase corporate profitability. These are important goals because they reflect an integral part of the corporate culture. AcxInet can be an important tool in ensuring that these business policies are supported.

My review of the site, therefore, looked at two factors: How could we organize the information that was already available on the intranet to make it more accessible to Acxiom's users? What new information or applications could we add to the site to make it more useful in terms of the stated objectives?

Key findings: site analysis

My analysis of the site as a whole uncovered five problematic areas, which, if better optimized, would have a significant positive effect on the site's usability. These areas are:

- Graphics
- Navigation
- Information architecture (the distinction between static reference material and changing, timely information)
- Links
- Prioritization of information

Graphics

The graphics on the AcxInet site are beautiful and well designed; however they are overused and frequently take away valuable space from the content.

While graphics are nice and may increase the usability of information, high-cost, fancy graphics may not return the investment on an intranet. Once you start with a high-glitz image, it's hard to turn back. By taking that approach, you add tremendously to the cost of creating or updating pages. As a result, pages get updated less frequently and their information value decreases. I favor low-tech, plain text unless you are adding value through interactivity.

So, forget the graphics unless they say something. Make your pages easy to update and add to them as often as makes sense. Keep it simple; keep it cheap. Don't lock yourself into a high-cost strategy before you know what the return is. It's always possible to upgrade to glitz once you have quantifiable results.

Navigation

The site is very confusing. I frequently got lost. Sites should be easy to navigate and require as few clicks as possible to find the desired information.

When the AcxInet site was designed, there was no centralized control or funding. Each business unit provided its own funding. The result is a variety of looks and navigation paths. For example, associate phone extensions are in the Associate section and business unit numbers are in the Corporate section. A simple button for all telephone numbers, available from every

MAKEOVER

page, instead of multiple phone lists buried deep within the site, would be a welcome and frequently used alternative.

Redundancy of information also is a problem. The Tools section lists many of the same options found in the Associates section. Yet it is unclear whether the links actually point to the same place.

Information architecture

Static, or reference, information is intermingled with frequently changing and time-sensitive information. There is no indication as to what information has been updated recently and what hasn't.

Static information has the same weight on a page as current, timely information. For example, the front page of the Associate section offers topics such as AcxInet Policy and Making of AcxInet which a visitor might read once. Yet, they are given the same prominence as the Classifieds section which, presumably, associates will visit frequently.

Links

Links to internal sections and external sites appear to be the same. An intranet user should always be aware of what information is company-sponsored and what information is publicly available.

Links to the outside should be relevant to the business objectives of the intranet. While it may be relevant to link to a customer's Web site to review information about the customer, it may not be necessary to provide links to Internet sites that are unrelated to your business.

For example, the AcxInet home page has a number of links to Internet sites, all of which have the same prominence on the page. However, only the link to the Acxiom corporate Internet site really deserves prominent placement on the intranet home page.

Prioritization

Important content is buried deep within the site. This issue relates to the navigation problems mentioned earlier. Though, in this case, it is not just the number of clicks it takes to get to the information, but whether the information is readily available.

For example, the FAQ section accessed from the Associate front page has a wealth of information about Acxiom's products buried within it. But I'm not sure anyone looking for product information would go to the Associate section to find it.

Recommended redesign

While we couldn't redesign the entire intranet, we took a look at some of the key pages to address the five areas of concern.

Specifically, Andrea Spertus, our senior information architect, redesigned the home page and the front page of the Corporate section. It wasn't just a redesign, however, but a rethinking based on the business objectives AcxInet is supposed to meet. Here's our analysis of the problems with each page and a recommended solution.

AcxInet home page

The most important space on any Web site is the screen that appears when a user first accesses the site (see Figure 1, page 24). Designers frequently refer to this area as "above the fold." With AcxInet, the space above the fold is filled with a large image that serves no purpose. Although beautiful, the image is too large and takes too long to load. In addition, the message is difficult to read; a different font should have been used.

Pat O'Hern (top) and Andrea Spertus of USWeb Utopia

SHAWN HENRY

Scrolling down the page, a visitor is presented with three buttons that direct the visitor down Associate, Corporate or Customer paths. These are apparently the main sections of the site. There is also a link to a What's New? section and two search engines, one to search the intranet and the other to access Internet search engines. The link to an external search engine seems unnecessary because searching the Internet is usually possible through a single click from the user's browser.

The What's New? section is the first place where the visitor encounters current, timely information. But clicking on the link brings you to yet another menu with only two choices. You are three clicks away from getting any information from the site.

The AcxInet team decided to make the front page a springboard for the Web, not necessarily just for AcxInet. "A lot of people are still unaware of the business potential of the 'Net, and we chose to link to some of the most frequented sites to share in an easy-to-find place," Acxiom's Tackett says.

So, in addition to links to other sections of AcxInet, the front page includes links to NASDAQ, Pointcast, Netscape, Microsoft, Sun, Apple, Yahoo, search.com, CNN Online, USA Today, Time-Warner, ESPNET, Weather and Dilbert.

While these are all excellent sites, the arrangement of the links on the AcxInet front page gives all the external sites equal weight with the internal sections.

The final element on the AcxInet front page is the navigation bar. This is at the very bottom of the page and requires scrolling down four times to reach it. The links on the navigation bar are "Home" (the top of the page from this point), "Tools," "Help," "Search" (AcxInet search, redundant on this page) and "Feedback."

Figure 1: The existing homepage features a bandwidth-eating image that slows loading and sends mixed signals by giving equal weight to intranet and Internet links.

The Tools page is one of the more popular. It gets almost 10 times the number of hits as the What's New? item that appears higher on the page, obviously an indicator of the value of the tools. The Tools page had 1,003 hits between Dec. 4 and 16, 1996.

Thus, the front page has no information on it. It is made up entirely of links. The page is static — it does not change and gives the visitor no indication of when the site was last updated.

For an intranet to be successful, it must be designed to encourage repeat visits. It is not enough to update content regularly; the site must adequately convey that new things are being added. If employees get the impression that the site is changing, they will be compelled to visit it regularly. The best way to give the site a dynamic feel is to create a dynamic front page.

The original AcxInet front page never changed. With its graphical links to What's New? and other areas of the site, it gives the user no clue as to when the contents were last updated. The user has no immediate way of telling whether this is a current site or merely one of the "ghost pages" haunting the Web.

For our mockup of a revised front page (see Figure 2), we significantly changed the design, but also the navigation strategy. The new design makes it immediately clear that the site is alive and well.

Instead of using unchanging graphics to draw users into the site, the new design brings the latest headlines directly to the very first screen. In this way, employees can quickly visit the site to see what has changed, instead of following multiple links before discovering some new announcement. Even the script-generated dateline at the top of the page serves as a subtle clue that the site is being updated frequently.

The new design also restructures how the site is navigated. Instead of dividing content into the ambiguous categories of Associate, Corporate and Customer, the new design considers the user's perspective and organizes the site more intuitively.

For example, the new design does away with the navigation bar at the bottom of the page and replaces it with a left-hand frame for navigation elements. These elements are dynamic, changing based on where the user is in the system.

On the home page, the navigation elements indicate the intranet's sections. The Community Pages relate to corporate culture. This is where the fun stuff is, like Associate pages and the hip page of the week. Company Info is the workhorse of the intranet. This is the section that should become an integral part of an associate's daily work life.

Instead of the separate links to Internet sites that took up a lot of real estate on the original home page, there is one link to Using the Web, which can be a jumping off point to any Internet links the Webmaster wants to provide. Finally, there are readily available and accessible phone lists.

Though not in this mockup, the navigation elements also would include a search option. This should link to an intelligent search engine that would let the visitor search the whole site or a particular section of the site.

Since it is an intranet, and you have more control over the client environment, you can be more creative, not having to worry that visitors will be on an unknown or unsupported platform. Thus, if everyone uses Netscape Navigator 3.0 as a browser, you can use Navigator extensions, such as frames, in your page design.

Corporate page

The Corporate front page has many of the same problems as the home page (see Figure 3). It has a lot of static information, so you can't tell when the section was last updated. It also has that mix of reference vs. interactive information.

The Morgan's Minutes section, which displays weekly communications from Acxiom CEO Charles Morgan, is one of the most popular on the intranet. Yet, it is almost overshadowed by the other links that appear to have equal or greater importance.

There is, for example, an ambiguous link to Netscape, which brings up a FAQ concerning using the intranet with different versions of Netscape. This is on the same level as, and is actually before, Morgan's Minutes and the CapComm Business Case Form, which is one of the most important sections on AcxInet. The CapComm Business Case Form is the way in which all purchasing requests must be submitted.

The redesigned Corporate front page (see Figure 4, page 25), now called Company Info, has the same visual graphic design elements as the redesigned home page. The dynamic navigation elements in the left-hand frame now include a Home link, which returns the visitor to the AcxInet home page. When you move down a level in the section, the navigation elements are updated again and

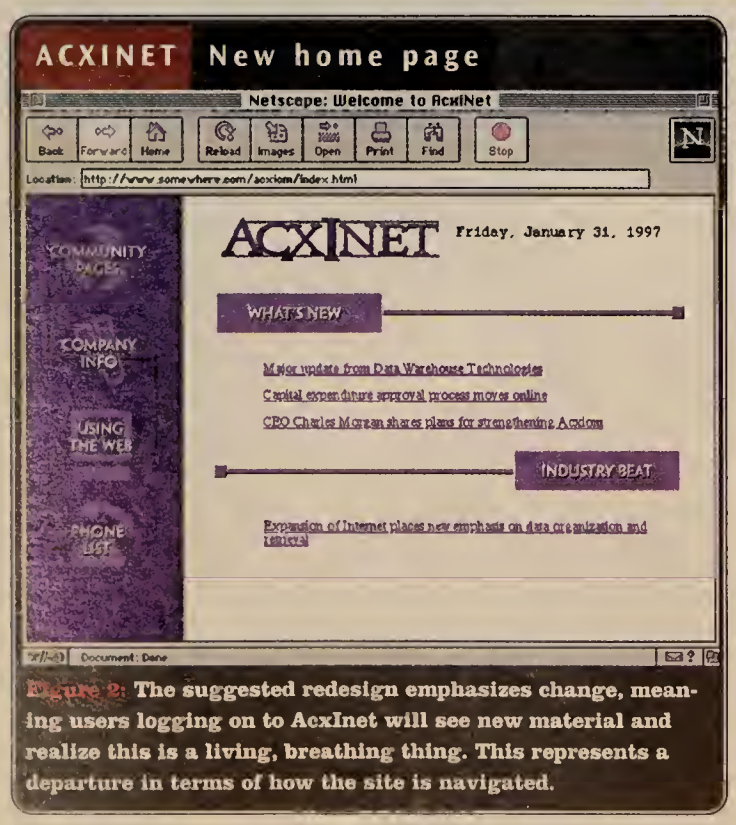


Figure 2: The suggested redesign emphasizes change, meaning users logging on to AcxInet will see new material and realize this is a living, breathing thing. This represents a departure in terms of how the site is navigated.

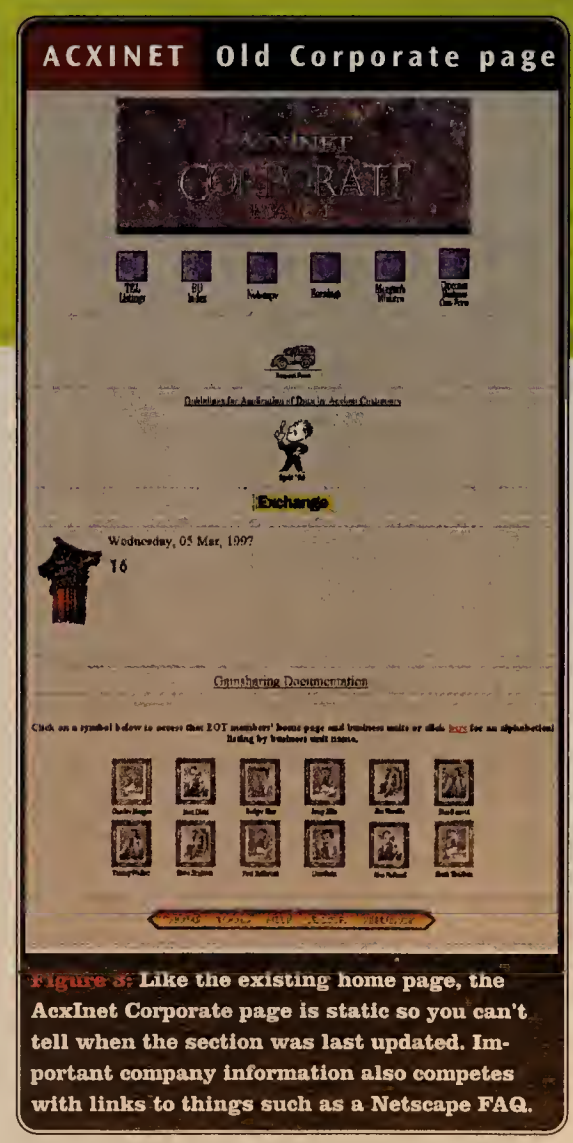


Figure 3: Like the existing home page, the AcxInet Corporate page is static so you can't tell when the section was last updated. Important company information also competes with links to things such as a Netscape FAQ.

The proposed replacement for the Corporate page features dynamic navigation elements that change relative to the page being viewed, showing now, for example, a link to the home page.

now include links to the front pages of the other subsections in the Customer Info section.

The information in the Customer Info section is clearly divided into three subsections. Acxiom News contains dynamic information. Note that Morgan's Minutes, which has moved up in prominence from its previous position, is also a news item on the home page. Thus, visitors can gain immediate access to the latest message from the CEO as soon as they enter AcxInet, and can go to the Company Info section to review his previous messages.

Rather than just reorganizing the information from the Corporate section, however, the redesigned Customer Info section suggests added functionality. The Customer Service subsection is meant to be the place for associates to look for and find information that will help them provide quality customer service. This realizes the very first business objective of Acxiom's intranet. The White Papers section includes a nice feature — a user can automatically fax a copy of a white paper to a customer by simply clicking on a fax link.

Suggested enhancements

The site is currently being used for what the intranet does best: making documents and information more widely available across the organization. However Acxion could be doing so much more with AcxInet to meet its business objectives. Among these are:

- Training. Acxion is using it's intranet for training by providing static Web pages. For real training and learning to take place, you need some degree of interactivity, for instance, use of a QuickCam and CUSeeMe for hands-on training.
- Intranet electronic commerce. This could include all activities that involve payment or accounting of costs, from office supplies to departmental cross charges, from travel expenses to software and information license fees.
- Direct database feeds from an intranet page. The Business Case Form in the existing system is a first step in this direction, but there is some hesitation on the part of users to give up their Excel spreadsheets in exchange for databases. Enabling users to access company databases via the intranet would add flexibility, ensure scalability and improve accuracy of data.

Summary

AcxInet is rich with information and has the potential of becoming a significant tool in enhancing the corporate goals of supporting customer satisfaction, associates and profitability.

The obvious vision and ongoing leadership and support from Acxiom's management is reflected by the diversity of information and the attention to tools to support the associates. With planning and attention to information architecture, navigation flow and design, this impressive site will become more widely used and an integral part of Acxiom's business operations.

BILL PARSONS

Acxiom's Chris Tackett and Roseann Allen say many of the redesign recommendations were taken to heart.

LEAVE YOUR EGO BEHIND AND BRING IN PEOPLE YOU TRUST

Although Acxiom Corp. won't implement all of USWeb Utopia's recommendations, the process was revealing and helpful, if not a bit painful, says Roseanne Allen, the technical manager responsible for implementing AcxInet.

"We had reached many of the same conclusions," Allen says. "The site was cluttered and out-of-date. They had good ideas about how to clean it up and make the presentation tighter."

As USWeb Utopia recommended, Acxiom is going with simpler graphics and striving to make the site easier to navigate. And it is adding many of its own twists, including the use of Microsoft Corp.'s ActiveX technology to push corporate news out to end users.

Allen says of the redesign process: "Managing content as it grows is a lot of work, and at some point, you have to reexamine what you're doing. But you have to go into the redesign process leaving your ego behind. I won't say it wasn't painful at times. It's like your little baby, and somebody is telling you your baby is ugly."

In trying times

BY BETH SCHULTZ

Content developers at Westinghouse know what it's like to build an intranet in the midst of a company downsizing.

The intranet team at Westinghouse keeps smiling despite corporate changes that slowed its efforts. Developers are: (standing, from left to right) David McGeehan, Alexis Joseph, Lee Averbeck, Jerry Boyle, Ken Wagle; (seated, from left to right): Joe Small, Terri Marts, Roger Hsiao.

Building an intranet while your company is downsizing — or rightsizing, as the euphemism would have it — can be rather dicey.

It's hard enough to collect Web content in the best of times. Imagine the challenge when individual content owners — not to mention whole departments or even business units — might disappear overnight. Add to that the difficulty of pumping up enthusiasm and getting employees to provide fresh material when their futures are uncertain.

The intranet development team at Westinghouse Electric Corp. knows these challenges well. Since Westinghouse formally launched its intranet initiative at the close of 1995, the corporation has either sold or spun off a number of business units. Those efforts culminated this past November when Westinghouse announced plans to separate into two companies.

Westinghouse would like to split its broadcasting and industrial businesses. It's awaiting federal regulatory approval for these plans.

The organizational gyrations slowed intranet development, says Ken Wagle, manager of research and development at Source W, the Westinghouse business responsible for developing intranet content.

Yet Westinghouse executives are looking to the intranet for stability and consistency during the corporation's transformation. They have mandated that the company's intranet home page comes up by default when employees turn on their computers, Wagle says. "That's where they want employees to begin finding their information."

On Nov. 13, 1996, for instance, browser-enabled employees who logged on could find the information about the latest Westinghouse makeover plans. A click on the prominently placed "Separation Announcement" button provided details about the plan to split the industrial and broadcasting businesses.

But Westinghouse executives see the intranet as more than just a basic information delivery vehicle. They view the intranet as a strategic asset: It gives Westinghouse a way to retain knowledge and expertise.

"Through the restructuring efforts, people with years and years of knowledge end up in different roles, or not with the company at all," says Terri Marts, managing director of Source W. "The intranet provides an archive of valuable information we can continue to draw and build upon."

The intranet, called Westinghouse Info Web, is part Marts' brainchild. A longtime manager at Westinghouse, Marts was a member of a corporate team charged with figuring out how to bring in state-of-the-art hardware, software and network technology and to help the corporation restructure and become more efficient (see sidebar, page 28).

One of the team's recommendations was that business units streamline publishing processes. Marts took on that responsibility for Source W,

which was providing graphics, audiovisual and printing services to Westinghouse. "I was asked to take on this business and learn more about the technologies that were available for rapid publishing and distribution of information," Marts says.

The Internet proved inspirational. "I came up with this idea of an information Web and thought it would be a way we could take the information we already had in digital form and make it available throughout the corporation," she says.

In early November 1995, Marts met with an IS manager to discuss her plans. As it turns out, IS also had identified the need for this type of information publishing system and already had formed focus groups to help it gauge interest. "Terri had her vision, and we serendipitously found that IS had the same idea. This confirmed her concept," says Jerry Boyle, a creative producer with Source W.

Source W and IS decided to partner on the intranet project. As luck would have it, IS had just begun a corporate-wide upgrade to TCP/IP as part of the effort that included migration to bring new technology to Westinghouse. And Source W was looking for a way to get better use out of the digital files it had been creating for various corporate projects.

"We decided if we do the central infrastructure piece, and have Source W do the fit-and-finish pieces, then that would enable the creation of local pages with less decision making about

JUGGLING EXISTING FILES

When content developers at Westinghouse Electric Corp.'s Source W started formatting digital files for the intranet back in late 1995, they naturally turned to HTML. Now, in many cases, they favor the portable document format (PDF).

Source W's tool of choice is Acrobat from Adobe Systems, Inc. (www.adobe.com/prodindex/main.html). Using this software, content developers took hundreds of existing digital files, converted them to Adobe PDF and posted them on the Web. PDF keeps the original file's formatting — graphics, fonts and color, for example — intact.

"We use Adobe Acrobat for delivering charts, brochures, manuals and printed pieces because of design considerations or if electronic files are available," says Joe Small, advanced technology group lead at Source W in Pittsburgh.

The possibilities seem endless. "We've used Acrobat to deliver the Westinghouse annual report, organizational charts, community service award nomination forms, brochures, employee gift matching forms and ethics manuals in multiple languages, to name a few," Small says.

Employees get the Acrobat plug-in as part of the standard desktop. This means, for instance, that a salesperson in the field can dial in to the Westinghouse Info Web, call up data sheets, product brochures and other documents and have them printed on-site. Customers will see exactly what they previously might have waited a week or so to get in the mail.

Source W would like to start integrating the forms capabilities available in Acrobat 3.0 to make the intranet more interactive. Human Resources, for example, could take advantage of the forms capability to allow online benefits enrollment. For now, employees have to print the forms presented to them on the intranet and mail or fax them to the appropriate destination.

— Beth Schultz

what the intranet should look like," says Dennis Kelly, lead systems analyst in Westinghouse's IS department.

In late November, Source W and IS delivered a proposal to the chairman and chief executive officer, the controller and the chief information officer. The executives almost immediately gave them the go-ahead. They recognized Westinghouse Info Web would make it easier to find information, result in cost reductions and help usher in the new corporate culture for which they were striving, Marts says.

"The culture of Westinghouse was business unit-oriented and focused on departmental needs, with systems built to control a large corporation. We want to become a small, lean, agile company with collaboration across many functions and units," she explains.

To help Westinghouse break out of its traditional mold, the first thing the intranet team did was blur the departmental lines, Marts says. Employees won't find won't Human Resources or Finance or Corporate Communications buttons on Info Web. Instead, content has been categorized into Corporate Information, Policies &

TO THE STATE OF THE ART

At Westinghouse Electric Corp., the development of the intranet complements a broader effort to deploy state-of-the-art desktop and network technology throughout the enterprise.

Westinghouse launched that effort, called the Strategic Information Technology Initiative (SITI), as part of a corporate reengineering plan devised in late 1995.

MATT BULYONY

Westinghouse IS staffers Dennis Kelly (left) and Gary Ellis handle the intranet infrastructure.

Through SITI, Westinghouse is moving from a mixed Ethernet and token-ring NetWare environment to an all-Ethernet, TCP/IP- and Windows NT server-based switched infrastructure, says Gary Ellis, manager or corporate engineering at Westinghouse. The standard desktop gets Microsoft Corp.'s Windows NT or 95 and Office95 suite, Netscape Communications Corp.'s Navigator 2.0 browser and Adobe Systems, Inc.'s reader for portable document format files.

Specifically for the intranet, Westinghouse uses Netscape's Commerce Server Version 1.3. It runs the software on a multipurpose IBM RISC System/6000 SP system. "During the daylight hours, it's concentrated on browser and newsgroup functions. In the depths of the night, it's doing backup," says Dennis Kelly, lead systems analyst at Westinghouse.

IS also has a few specific-purpose Web servers, Kelly says. One of those servers, for example, delivers personal database information to human resources managers for administrative tasks.

Westinghouse plans to wrap up the rollout this year.

— Beth Schultz

Procedures, Corporate Services and Employee Services segments.

If a Westinghouse team is researching a business opportunity in a country in which it hasn't yet worked, for example, it would need to check on that country's environmental policies. Previously, that sort of information required wading through various documents maintained by the environmental affairs department. Now the team heads to the Policies & Procedures site and conducts an online search for the information.

To meet their goal of getting Westinghouse Info Web up by April 1996, intranet team members met with about 20 or so departments to help them identify potential uses. The departments were receptive to the plans and relatively excited about this new opportunity, says Alexis Joseph, who, as the Source W account representative for Westinghouse, was involved in those presentations.

Despite the changing climate at Westinghouse, Joseph attributes the departments' willingness, and in some cases eagerness, to participate in large part to a letter they had received from the executive management team asking them to contribute to the effort. "It's great to have a high-level buy-in that's communicated downward," Boyle adds.

The departments also had another incentive for early intranet involvement: IS was picking up the cost of having Source W convert documents to Web-ready formats during the rollout. Its goal was to get the departments involved, then turn over creation of simple, static Web pages to department content providers.

Toward that end, IS is training authors on Microsoft Corp.'s Internet Assistant and giving them access to the folders on the intranet in which their documents reside. Content providers, then, are responsible for keeping information accurate and up to date.

The goal is to get virtually everyone — from secretaries on up — involved in the process. "With the downsizing, section managers are busy taking on more responsibility. They'll need help with the content," Wagle says.

When content providers or even whole departments disappear as part of rightsizing, the intranet team tries to get someone to take charge of the information or take it off the Web, says Lee Averbeck, a technician at Source W. The team encountered this problem earlier this year, for example, when the corporate library was eliminated. The team was able to transfer responsibility for the documents that library had posted on the Web to one of the business unit's technical libraries.

As of last count, which occurred around the time activity began tapering off because of the separation announcement, Source W had put up approximately 500 HTML pages and 75 portable document format (PDF) files on the intranet, Averbeck says. Many PDF files, he notes, account for hundreds and hundreds of Web pages (see sidebar, page 27).

And now activity is starting to increase. "It's kicking up again. Everybody's rethinking how to use the intranet," Joseph says.

For example, three groups recently began posting weekly newsletters on Westinghouse Info Web. Team members expect this to renew interest in and increase traffic on, Westinghouse Info Web as other departments follow suit.

Source W and the IS department expects the intranet's nature to shift a bit this year as they attempt to make Westinghouse Info Web more than just a place to publish static information. "We need to concentrate on applications that will save money, like processing forms, and on making the intranet more dynamic, through database access," says Gary Ellis, an of corporate engineering manager at Westinghouse.

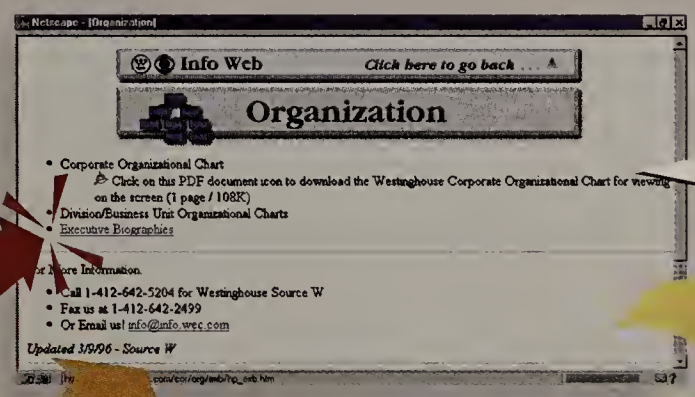
The trick, Kelly notes, will be figuring out what applications are the good ones and to which databases to connect. "A lot of people have applications they'd like to try on the intranet," he says, "but given Westinghouse's current situation, we want to make sure there's business value in what we do."

SITE SEEING

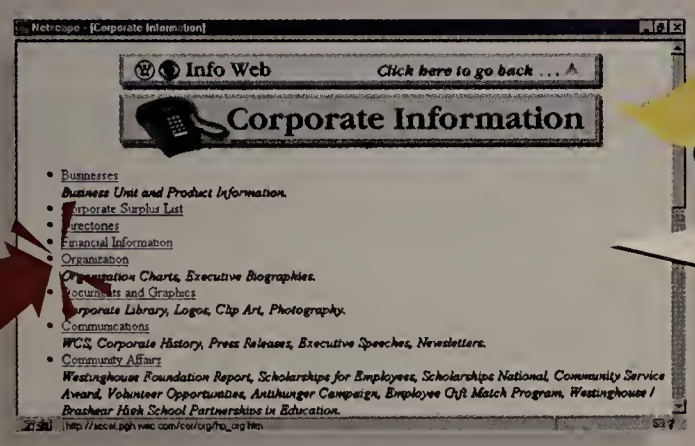
A step-by-step guide to a key Westinghouse intranet application

Strategic planning

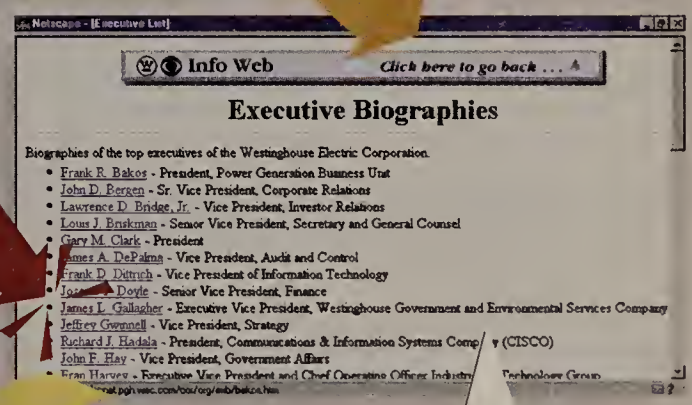
A business development manager with Westinghouse Electric Corp. has just learned that a central European country is soliciting bids for a project to upgrade its power plants. Winning the contract could potentially mean $100 million or more for Westinghouse, so a top-notch proposal is in order.



2 The manager evaluates the options presented on the Organization page and decides he wants to peruse the executive biographies, so he clicks there.

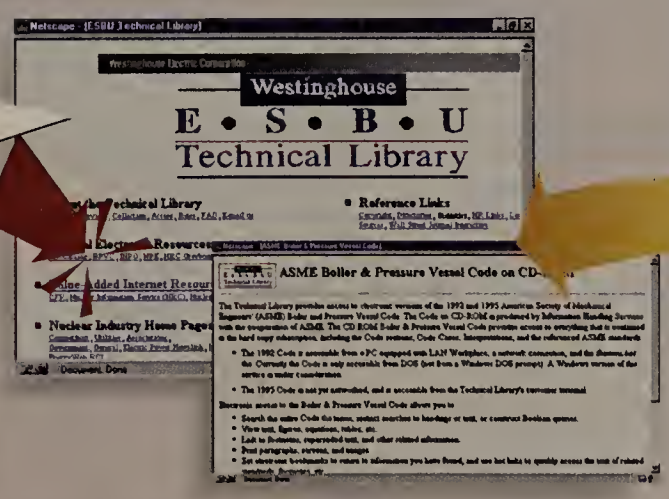


1 Quickly scanning the site, the manager finds what he needs to get started: a hyperlink to organizational charts and executive biographies. He clicks on "Organization."



3 The manager scans for executives who could help pull together a proposal. He decides to read each of their biographies to get a better sense of their expertise. He then decides to begin pulling together basic information for the proposal, returns to the Corporate Information page and clicks on the "Documents & Graphics" link.

4 The manager looks at the site and decides to head to the ESBU Technical Library to begin culling the technical information he'll need for the proposal.



5 He wants to check the details on boiler and pressure vessel codes for the proposal. He finds the "BPVC" hyperlink under the Internal Electronic Resources, clicks on it and begins reading. In addition to getting technical information from the intranet, the manager will be able to pull down financial data, environmental policies, corporate logos and other documentation needed for the proposal.

NetworkWorld
TECHNICAL SEMINARS

IPv6
THE NEXT GENERATION FOR TCP/IP INTERNETWORKS

The next generation of Internet Protocol — IPv6 — will significantly impact your TCP/IP network. The Internet explosion now requires new functions that go beyond the capabilities of the current Internet Protocol, or IP. These include enhanced security, support for real time traffic flows and expanded addressing capabilities. The addressing issue has been one of the most significant concerns as it was predicted that the Internet community would run out of available addresses, thus limiting the growth of this critical communication resource.

In late 1990, the Internet Engineering Task Force (IETF) initiated efforts to select a successor to the IP. In late 1993, the IETF formed the Internet Protocol – Next Generation (IPng) working group, which was chartered with investigating the various proposals, and recommending a course of action. The outcome of those efforts produced what is now known as IP version 6 (IPv6), which is currently being implemented by many vendors.

Perhaps more importantly, IP is the foundation of the TCP/IP protocol suite. Therefore if IP is revised, other protocols must be changed as well. The significance of this protocol revision extends to LANs, MAN and WAN transmission systems, as well as the upper layer protocols and application programming interfaces.

Whether you are a network manager, designer or software developer, this seminar, taught by internetworking expert Mark Miller, will provide you with information on the widespread ramifications of this new protocol. You will learn how to effectively plan and implement a successful, orderly transition.

Enterprise Network Management
Understanding SNMP, SNMPv2 and RMON

With the explosive growth of enterprise internetworks, the need for integrated network management systems to help simplify management operations has never been greater. Today's enterprise network management systems need to manage thousands of elements — from the hardware devices all the way to the applications and processes running on these networks.

SNMP (Simple Network Management Protocol) has become the de facto standard for end-to-end enterprise network management. Recent enhancements to the SNMP-based technology, including SNMPv2, RMON2 and Web-based management tools, improve this popular system. With those enhancements, however, come additional challenges for the network manager.

This one-day, information-packed seminar, taught by internetworking expert Mark Miller, will help you understand the elements of an SNMP-based network management system, how to implement SNMP with your internetwork, plus the various enhancements such as the new message formats and improved error codes provided with SNMP version 2. You will learn about recent enhancements to the Remote Monitoring (RMON) network management architecture, known as RMON2, and the advantages of implementing RMON throughout your internetwork. In addition, you will see how SNMP is being used to manage broadband networks, including frame relay, SMDS and ATM.

You will also be introduced to the next generation of network management: Web-based tools that integrate SNMP and browser technology. This new technology consists of three components: network management software which runs on a Web server, proxy agents which operate on the managed devices, providing updates to the Web server, and a browser-equipped workstation that can access those management details from any location within the enterprise.

ATTEND BOTH SEMINARS AND SAVE $100!

12 TOPICS YOU DON'T WANT TO MISS!

1. Learn how the implementation of IPv6 will allow continued expansion of the global Internet
2. Explore the effects of IPv6 on other elements of your internet or intranet architecture
3. Understand the limitations of the current Internet Protocol — IPv4
4. Discover key features of IPv6, including larger addresses and security
5. Learn details of the proposed IPng solutions: CATNIP, TUBA and SIPP
6. Understand the key functional and protocol enhancements incorporated into IPv6
7. Analyze the formats of the IPv6 packet header, Extension headers, ICMPv6 messages and Neighbor Discover messages, and others.
8. Gain detailed insights into how the IPv6 transition will affect other protocols, such as Ethernet, token ring, RIP and OSPF
9. Learn how to strategically plan your transition from IPv4 to IPv6
10. Learn how leading vendors such as Bay Networks, Cisco Systems, Digital, FTP Software, Sun and others are implementing IPv6
11. Learn about the 6Bone — a worldwide IPv6 network
12. Discover how to obtain public domain sources of further information on IPv6

ATTENDING THIS SEMINAR WILL HELP YOU . . .

1. Understand the Agent/Manager model of network management
2. Compare and contrast the ISO, IEEE, DMTF and Internet network management architectures
3. Discover the next-generation architecture of enterprise management tools: the Web-based managers and agents
4. Understand the key components of the Web-based Enterprise Management: the HyperMedia Management Schema (HMMS), the HyperMedia Object Manager (HMOM) and the HyperMedia Management Protocol (HMMP)
5. Learn the details of the key elements of the Internet Network Management framework: the SMI, the MIB and the SNMP
6. Discover how existing Web-based enterprise managers and existing SNMP-based devices can be integrated into a cohesive system
7. Understand the enhancements found in SNMPv2, plus the proposed security enhancements: SNMPv2u and SNMPv2*
8. Survey the key elements of Abstract Syntax Notation One (ASN.1), the language used to define SNMP message formats
9. Understand the key differences between the RMON and RMON2 standards for remote management of the enterprise
10. Consider strategies for the coexistence of SNMP version 2 with existing SNMP version 1 systems

Register and You Will Receive . . .

- *Comprehensive seminar workbook*
- *Copy of* Troubleshooting TCP/IP, *2nd Edition, by Mark A. Miller, P.E.*
- *Exclusive protocol reference guides: TCP/IP, IPv6 and OSPF*
- *CD containing over 1,000 Internet RFC, FYI and STD reference documents*
- *Luncheon and break refreshments*
- *All of the above included in your $450 registration fee*

Note: If you can't attend, a full attendee kit is available for just $129!

Sponsored by:

FTP SOFTWARE · PROCESS SOFTWARE CORPORATION · Bay Networks · CISCO SYSTEMS · digital

DATES & LOCATIONS

IPv6 SEMINAR	CITY	SNMP SEMINAR
3/4/97	Denver, CO	3/5/97
3/11/97	Dallas, TX	3/12/97
4/3/97	Washington, DC	4/4/97
4/8/97	New York, NY	4/9/97
4/23/97	Boston, MA	4/24/97
5/13/97	Atlanta, GA	5/14/97
5/28/97	Chicago, IL	5/29/97
6/10/97	San Francisco, CA	6/11/97
6/17/97	Irvine, CA	6/18/97
6/24/97	Philadelphia, PA	6/25/97

Register and You Will Receive . . .

- *Comprehensive seminar workbook*
- *Copy of* Managing Internetworks with SNMP *by Mark A. Miller*
- *Four exclusive protocol reference guides: SNMPv1, SNMPv2, RMON and RMON2 MIBs*
- *Valuable course diskette containing reference documentation and standards for SNMP and related technologies*
- *Luncheon and break refreshments*
- *All of the above included in your $450 registration fee*

Note: If you can't attend, a full attendee kit is available for just $129!

Sponsored by:

ASANTÉ · HP OPENVIEW · HEWLETT PACKARD · CABLETRON SYSTEMS The Complete Networking Solution™

Dial Our **FAX-BACK** Information Line at
1-800-756-9430
for a complete seminar outline and registration form.
When prompted, request document #60.

Call 1-800-643-4668
Register today for the seminar nearest you!

Web/E-Mail Information
Obtain full seminar information and register on-line in the Professional Development Group section on our Web site at:
www.nwfusion.com
OR
send a request to
seminars@nww.com
Please put the word "NETWORK" in the subject field.

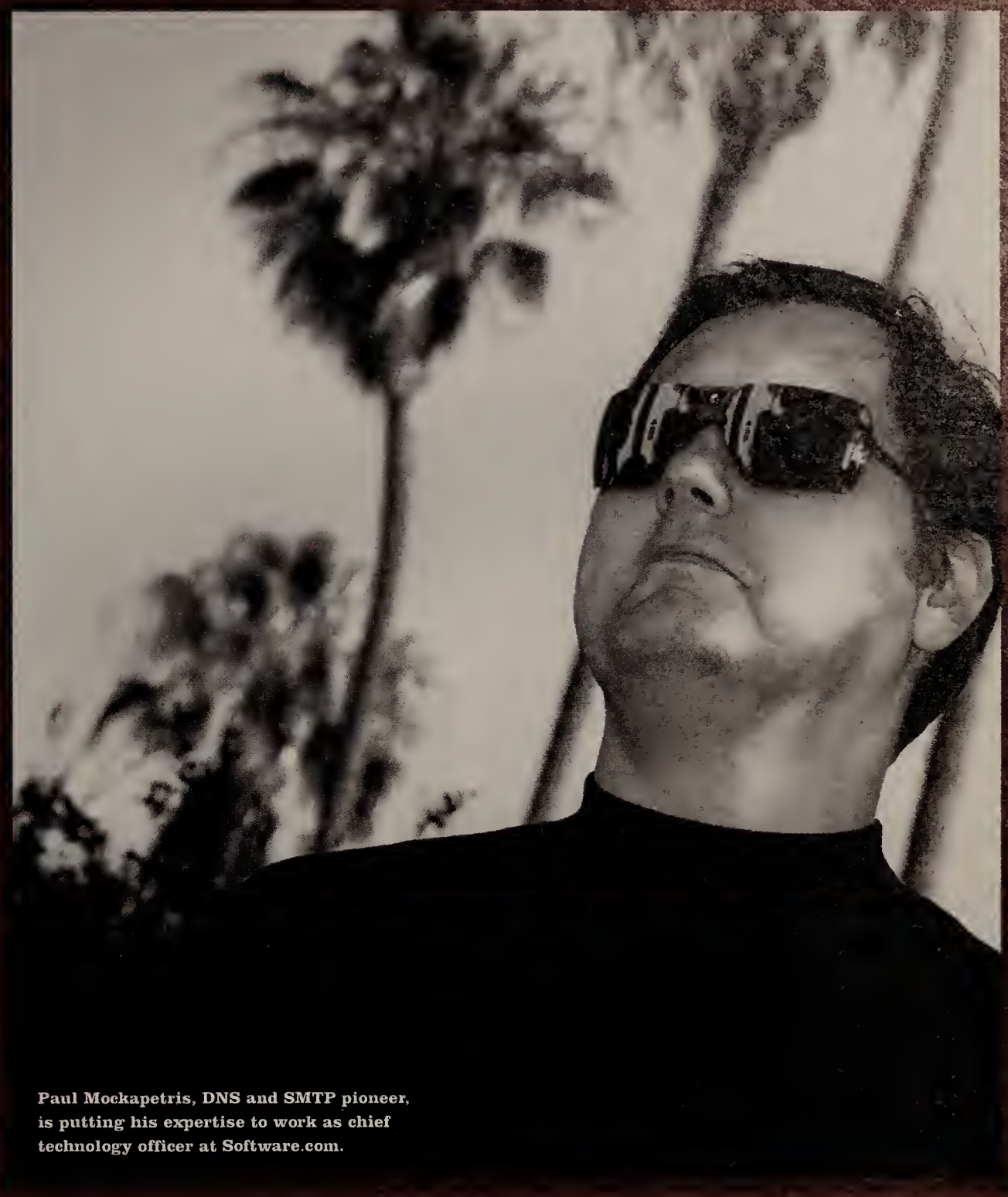
company decide to get connected, it is always an order of magnitude harder to change one of these systems

INTRAVIEW

Q&A

Playing the name game

When it comes to recommending how to tackle an intranet naming system, you have to give Paul Mockapetris' ideas credence. After all, he's founding architect of the Internet's Domain Naming System (DNS). Mockapetris also knows Internet messaging, having authored the first Simple Mail Transfer Protocol implementation.



Paul Mockapetris, DNS and SMTP pioneer, is putting his expertise to work as chief technology officer at Software.com.

RANDALL S. ENCINAS

Now as chief technology officer at Software.com, Inc., an Internet software company, Mockapetris is making strategic decisions regarding intranet products. He recently talked with Mark Gibbs, IntraNet's *editorial advisor.*

Let's start with the big question: What is your take on intranets? How important are they to corporate strategy?

Intranets are essential to pretty much any business enterprise that wants to use computers because that sort of networking is the next stage in the evolution of the computer world. Some people think intranets are an optional thing. I just don't see it that way; intranets are essential. But the real issue is how much they are connected to the Internet and what the good value is there.

As the architect of the Internet's DNS, what advice do you have for implementing naming solutions for an intranet?

My first rule is that intranets should have a naming system that is compatible with the rest of the world. This is because, should a company decide to get connected, it is always an order of magnitude harder to change one of these systems once you are used to it than it is to introduce it right in the first place. So, first of all, your naming system has to be compatible with outside world conventions. That is not that hard a requirement; it just means you have to think a little bit about how it is going to be connected in the future.

The system you want to use from the standpoint of selecting products will vary depending upon what kind of a shop you have set up, but all of the big vendors try to give you alternatives that are sort of compatible with Internet standards. There has been some back and forth about what that should be, but for the moment people are pretty much settled on using the domain names. There is going to be a bunch of administrative issues about how those change over time, but that is just the easiest way to go, and then you use whatever extensions are available in the particular sort of environment that you have chosen for your company, whatever [systems you use].

By what should an intranet manager's decision be constrained?

For example, if you decide you are going to name the top-level domains in your own internal DNS "ac" instead of "edu" because you think academic community is the right choice, that is not really a compatible thing. Another thing we've learned is that, in general, the naming structure has to follow the structure of where authority for networking is allocated within your company or university or whatever. So if in your university you allocate by departments, that is

"My first rule is that intranets should have a naming system that is compatible with the rest of the world. This is because, should a company decide to get connected, it is always an order of magnitude harder to change one of these systems once you are used to it than it is to introduce it right in the first place. . . . It is not that hard; it just means you have to think a bit."

the way you allocate computing resources.

There are a lot of people who put too much information in a name. For example, they try including an address — like a street address or some kind of physical locale — along with the disposition of the network management hierarchy or the network configuration. I think of Casey Stengel, a baseball manager who told his players to line up alphabetically by height. There is a problem when you are trying to do it two different ways at the same time.

That is my primary advice. After that, just follow simple, easy-to-use names. Don't try for the longest names in the English language. Don't try to be too cute.

During the past year, we have seen a number of vendors produce their own DNS implementations. Microsoft Corp., for example, has embraced DNS. Which vendors are, and are not, doing it right?

I am going to get myself into a certain amount of trouble here. In general, software implementations are like wine: They get better with age. It is not like the milk issue where you look for something that is the freshest possible. So the best you can say about the Microsoft implementation is now it is several spins down the road. Right now, what you are looking for is something that has sort of a mature pedigree and that tracks the developments. You just can't take something that is five years old and has never been modified. The Microsoft one is going to be quite nice.

There are a number of new things that are coming out with DNS having to do with security and being able to dynamically update, which means there is an opportunity to totally rewrite that list of who has the good implementations and who doesn't. A year from now people will be expecting a set of features that are not available today.

So what would you say is the leading DNS implementation in, for instance, the Windows NT arena?

Well, we offer one that is out there for people to take for free, and Microsoft's implementation is out there. We like to think that ours has the ease-of-use features and so forth that people might want, but both are credible.

Novell, Inc. has been actively promoting its Novell Directory Services, and Sun Microsystems, Inc. has bought into NDS through its cross-licensing agreement with Novell. What do you think of NDS, its position in the market and its future?

Things like NDS and [Banyan Systems, Inc.'s] StreetTalk that people have been talking about interfacing with X.500 are one notch above the expectations we have for today's DNS. They are sort of repositories for systems configuration information in a more general sense than the DNS, so what you are talking about is a new level of system.

People are going to try to centralize on access schemes such as [Lightweight Directory Access Protocol] and try to make those uniform. The system that best adopts to those quasi-open standards will be the one that has the most success.

So NDS as it stands right now is a nice thing to have and it is very useful in some environments, but a couple of years down the road, the question will be: How well do those things answer to the open standards requirements in interfaces?

You mention StreetTalk. What do you think of it?

We have a relationship with Banyan and have been looking for ways to use StreetTalk. Just like NDS, it is basically a proprietary system that is trying to figure out how to get out into the sort of nonproprietary or at least larger standards-based marketplace. We have been looking closely at how to do that.

So if I ask you to stare into your 10-megawatt crystal ball, what will the state of directory services be two years from now?

There used to be two important things people wanted out of a directory system. One was white pages. But that role, except in the intranet, is gone because people are using Web search technology. The Web provides access to more sources of information than is traditionally stored in a directory. So [DNS] as we have thought about it in the past is just toast. It has no chance. That is somewhat controversial, but I think it is obvious.

The other part is the distribution engine for configuration information so people can centrally manage even if their systems are distributed. One of the aspects of that is a corporate telephone book, which I think is completely different from the way you handle a global white pages service. And that is where new directory services are going to shine.

Directories are going to have to interface to conventional corporate database systems, which in some cases represent the whole enterprise — they are the central core of what's going on. When a new employee's information is entered into that database, all of the corresponding network parameters and configuration variables would be automatically generated. So there has to be an interface from that level of database technology into the directory service.

The directory service has to function adequately within the intranet and, as I said before, be able to interface to the outside world so a company's partners will be able to easily exchange information with employees and so there's a way to flow information from the Internet down into the configuration of your servers.

Some people speculate that DNS is going to be replaced and that may happen, but it is not going to be replaced by very heavyweight technology.

Now let's move on to E-mail. Many people are concerned about SMTP-based E-mail from a security standpoint. What's your perspective, speaking from your experience authoring the first SMTP implementation?

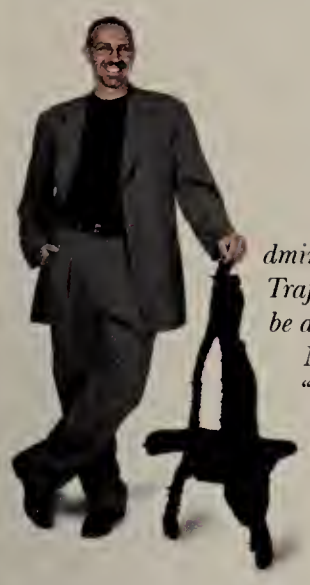
I have sort of been circling back to that work, and it's a profoundly changed world. People who are worried about SMTP have to read from a next textbook, not Volume I on how E-mail works, because the Internet world has changed so much.

SMTP-based E-mail takes a while to get configured, and early efforts tend to be a little bit brittle and certainly the security concerns and failures people have heard about in the past are based on a lot of those early implementations. Some problems will continue, since even some of the most recent implementations have been done without placing a premium on security.

Nobody has a real solution to flexibility for security and other kinds of features that people want in E-mail, but people are starting to add those things to SMTP mail. If you want receipts, for example, you can get receipts. I think there will be attachment conversion and integration with voice mail, pagers and other systems. I don't think people know what they want exactly in the security arena, from the standpoint of encrypted mail.

The Web provides access to more sources of information than is traditionally stored in a directory. So [DNS] as we have thought about it in the past is just toast. It has no chance. That is somewhat controversial but I think it is obvious."

All at Sea with Fear



Admiral Nelson was on the bridge of his ship at the battle of Trafalgar when a cry came from the crow's nest: "Cap'n, there be a man-o'-war on the horizon!"

Nelson squared his jaw, turned to the cabin boy and said: "Go below and bring me my red jacket so if I am wounded the men will not see my blood and lose heart."

"Aye, Cap'n," said the cabin boy, and run below. Just then, there was another cry from the crow's nest: "Cap'n, I be wrong! There be 10 men-o'-war!"

"Just a second, cabin boy," Nelson said. "While you're at it, bring my brown trousers."

If you read last month's column, in which I discussed the fearsome way intranets might grow, and concluded that they stand a good chance of quickly becoming huge, you can perhaps understand how Admiral Nelson felt facing those 10 battleships. So, like him, if you're going to be afraid, at least have some kind of response.

The number of documents to come may seem daunting, but to get the greatest benefit from your intranet, you should be constructing an environment in which every department, workgroup and user can publish at will. So be smart and make publishing easy.

By all means, give users an editor such as Microsoft Corp.'s FrontPage or SoftQuad International, Inc.'s HoTMetaL Intranet, and teach them how to create documents.

To make it even easier, simply tell users to drop their documents — any old documents — into particular folders on the intranet. Use a program that automatically converts those documents into HTML.

Better yet, just ensure that users' browsers can display whatever file formats your intranet may use. If you use a lot of Word documents, for example, make sure all browsers either have a plug-in that supports that file format or configure the browsers to launch Word when they receive that document type.

JOEL NAKAMURA

In fact, you won't even need to have content providers link their documents into the rest of the intranet. Just let the search engine index everything and — voila! — nothing in any of the user documents is excluded.

This strategy will serve you well in the intranet's early days. But be forewarned: As your system rushes toward one million documents, problems are going to arise. If you index everything on your million-document intranet with wild abandon, you'll end up with massive indexes and search times that become ridiculous.

That is, unless you plan to have huge amounts of RAM. (Consider that the Web's AltaVista search engine uses 6G bytes of RAM and a huge access pipe to achieve its amazing performance).

But what can you exclude from the index? It's going to be pretty tricky to figure out which documents are useful — and to which users — because the chance of the IT group examining, let alone understanding, all documents added to the system is, to say the least, slim. What's more, the intranet is supposed to be the primary repository of the organization's interests and thinking, so it's kind of hard to start eliminating items from an index.

I've previously promoted the value of breaking your intranet into Organization, Group and Personal domains (see "King Canute: A Lesson for Intranet Managers," *IntraNet,* Sept. 1996, page 46). All documents in the Organization domain are public; documents in the Group and Personal domains can fall into the public or private categories.

The key to managing data in an intranet environment is to ensure searches are conducted on relevant data. A public document that falls in a Group domain should be searchable by the entire organization. On the other hand, public documents belonging to individual users should be searchable only by members of the group to which they belong.

In this environment, the search space for members of each group would be their own private and public document sets, the public documents of each of their fellow users in the group and documents belonging to the organization as a whole.

A serious search engine should be used for documents in the Organization domain so users perceive good performance. They should get the same performance when searching documents in the Group domain. This will be achieved because there's a smaller number of documents through which to search or because a separate search engine has been deployed to handle group requests.

The trick will be to provide facilities that integrate the results of all search levels into one set of data.

Here's an example: If a support group user creates a public document explaining how to diagnose problems with a product, and the Web server log shows the document is getting scores of hits daily from employees within the department, then the support group should adopt the document into its private set. If the document is generally useful, the group might elevate it to its public set so the entire organization has access.

Out-of-date or otherwise irrelevant documents can be handled by using a Web server log analyzer to monitor how often each document is retrieved during the course of a month or a quarter. You can then start to deal with documents that are not being used anymore. Your next step — notifying the document owner, archiving, deleting the file, and so on — will depend on the politics of your organization.

Now you have a foundation for managing content, but there's still plenty to fear in building an intranet and planning for the million-document mark.

If you come up with a response more comprehensive than Admiral Nelson's, drop me a line at mgibbs@ gibbs.com or call me at (800) 622-1108, Ext. 504.

Now an NT Firewall that's as Good as a Gauntlet®.

Guess we'll call it Gauntlet NT.

Gauntlet Internet Firewall for NT

Windows NT®-based networks are providing endless opportunities for electronic commerce and mobile computing. Unfortunately, there are hackers out there, and whether Internet or intranet, your ability to eliminate unauthorized access on any NT network is only as good as your firewall. Trusted Information Systems has been setting security standards since 1983. Today, our Gauntlet® firewalls set the standard for Internet security. And, now, TIS introduces Gauntlet Internet Firewall for NT, the new standard for Windows NT® operating system security. To find out more, visit our web site or give us a call for a Gauntlet NT information kit.

1-888-TIS-FIRST • www.tis.com
e-mail: gauntlet-nt@tis.com

TRUSTED INFORMATION SYSTEMS, INC.
Building a World of Trust

Circle Reader Service #5

Intranets & the 'Net

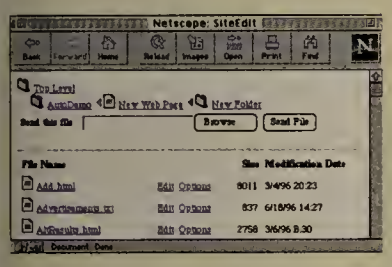
Covering: Internet Technologies and Services for Collaboration and Electronic Commerce

Briefs

■ **Mustang Software, Inc.** *has added PPP support to its Wildcat Interactive Net Server, which allows users to view the Web server's pages via* **direct-dial links** *rather than an Internet connection.*

& *Mustang Software: (805) 873-2500.*

■ **Pacific Coast Software, Inc.** *this week makes available SiteEdit Pro Version 2.0, a $179.95* **Web management tool** *that lets you move, copy,*



delete and rename Web files and folders. It also includes support for file upload from Microsoft Corp.'s Internet Explorer using a custom ActiveX Control. Pacific Coast also started shipping Web-Commerce Solution 2.0, an electronic commerce storefront for establishing cybermalls online. Both are available for purchase at www.pacific-coast.com.

■ *Fairfax, Va.-based* **Web-Methods, Inc.** *is shipping the WebMethods Automation tool kit, a $295 Java-based tool that includes Automation Engine for aggregating and retrieving specific data from Web sites and pulling them into a single* **intranet data source.**

& *WebMethods: (703) 352-8501.*

■ **Lucent Technologies, Inc.** *is rolling out a software distribution server designed to enable end users on a corporate network to obtain new or updated software over the company's intranet. Terranova Express is a hardware and software system that lets companies establish* **electronic software storefronts** *and control application versioning among employees.*

Terranova Express is available now for $11,795.

& *Lucent: (800) 462-8146.*

From Tikki Island to the corporate boardroom

OnLive Technologies pitches group communications software to large companies.

By Chris Nerney
Cupertino, Calif.

OnLive Technologies made its name by helping to build exotic three-dimensional virtual communities. One of the best known sites is MTV's Tikki Island, where Internet users guiding bizarre avatars roam the landscape and engage in group conversations with other users, all speaking with their real voices.

Introduced last year, the company's Traveler software, which supports Tikki Island, was aimed at two markets: the chat room crowd and virtual reality, fantasy game aficionados looking for the latest techno-thrill.

But OnLive is betting its immediate future not on the shifting sands of consumer cybercool, but on the more pragmatic world of corporate communications.

The company is pushing to establish itself as the premier vendor of products for real-time group business communications over the Internet.

"We're shooting for a Web site market," said OnLive Chief Executive Officer Betsy Pace. "We believe products that deliver live interaction on Web sites can make differences to companies in their core businesses."

In late November, OnLive unveiled its flagship product, OnLive Community Server, which allows large groups of people to communicate in real time over the Internet using their own voices.

This month, OnLive announced it will soon release Text Server, software that allows Web sites to host live text-based conversations among multiple end users.

OnLive also recently an-nounced a partnership with data conferencing software vendor DataBeam Corp. to develop products that combine voice conferencing with data sharing over the Internet in real time.

This would allow, for example, many online end users to listen to a presentation while viewing charts and graphics on their monitors.

Founded in January 1994 as Enter Television, an interactive television company, OnLive has attracted an enviable amount of venture capital, including a $23 million deal last June with SoftBank Holdings, Inc. Other investors include Intel Corp., AT&T and Kleiner Perkins Caufield & Byers.

Pace, an eight-year verteran of Apple Computer, Inc., joined OnLive in December 1995. She previously was general manager of Paramount Interactive, a Web site promoting Paramount Pictures' movies, videos and other products.

OnLive's product line has numerous significant business uses, Pace said, including distance learning, corporate training, customer support and marketing.

And while 3-D environments currently hold little interest to corporations, Pace expects that to change in the next year or two.

"As technologies emerge and bandwidth constraints relax, increasingly customers, including corporate customers, are going to want realistic visual support for online communication," she said.

OnLive Community Server is priced at $2,295 for 15 voices, $6,495 for 50 voices and $8,995 for 75 voices.

OnLive Text Server and OnLive-DataBeam products are scheduled for release in the second quarter of this year. Pricing has not been announced.

✆ OnLive: (888) 866-5483.

Sterling eyes 'Net EDI gold

By Ellen Messmer
Columbus, Ohio

Sterling Commerce, Inc., which has long provided electronic data interchange software for use over value-added networks (VAN), is now moving into Web-based electronic forms.

Just this month, Sterling Commerce began shipping the Web Link Module, a client/server software module that works with Sterling's core EDI message handler, Gentran: Server. The module comes with Web Link Plug-In, Web Link EC Forms, Web Link Application Integration Server and a tool kit for creating forms using elements such as table lookups and Open Database Connectivity calls.

If you want to begin trading with business partners on the Web, you put the Web Link Plug-In on your Web site so registered trading partners can download it for use with a Web browser. The plug-in lets the trading partner access the Gentran:Server mailbox from the browser to get EDI business information from you. The partner can also transmit files to you via encrypted Web transport.

Sterling's Web Link Module uses security technology from Cambridge, Mass.-based One-Wave, Inc., said Susan Eskin, Sterling's vice president of marketing and product management. "The encryption plug-in for the browser generates keys on the fly," Eskin said. "You can create a secure, encrypted link between the Gentran mailbox and the browser over TCP/IP."

Sterling Commerce's *Web Link marks the company's move into Web-based electronic forms.*

The Web Link Application Integration Server, residing on a Windows NT or Unix server, would typically sit behind the corporate firewall and the Gentran:Server.

"It validates the user based on the user ID and password encrypted," Eskin said.

Once the electronic forms data is received at the Gentran: Server, you can check whether the variables have been filled in and the data forwarded to appropriate back-end business systems from The Baan Co., Oracle Corp., PeopleSoft, Inc. and SAP. Corp.

Sterling also is developing a set of electronic forms, called Gentran:Smartforms, that sit directly on Windows NT desktops.

Corporations that send and receive tremendous volumes of EDI messages each day — often called EDI "hubs" — can set up preconfigured Gentran:Smartforms for their smaller trading partners, called spokes in the EDI business.

Smartforms use prearranged data-entry and communications profiles to send and receive EDI transmissions. Sterling Commerce staff can assist in drawing up the proper forms for each small trading partner, or the EDI "hub" corporation can take on the job itself.

"You can send the forms over a VAN or an IP network," Eskin said. "Eventually, we'll have Web-enabled Smartforms based on ActiveX Controls. You'll have to use the Microsoft Internet Information Server."

✆ Sterling Commerce: (614) 793-7000.

Sometimes opportunity knocks.

Sometimes it blows through your door,
charges through your office,
kicks the feet out from under you,
jumps on your chest
and stares you in the face.

For a limited time (translation: do something about this today), Compaq is offering some exceptional incentives on some very exceptional products, all of which can give your business a competitive advantage.

COMPAQ

Has It Changed Your Life Yet?

Compaq Armada 4100 Family
Reduced up to 27%.*
Free Li-Ion Handle Battery
with Armada 4120 (thru 3/31/97).**

Compaq LTE 5000 Family
Prices reduced up to 20%* on
LTE 5380 and LTE 5400 models.

Compaq Armada 1100 Family
Starting at $1,299.*
Free PC Card Modem with any model
(thru 4/30/97).**

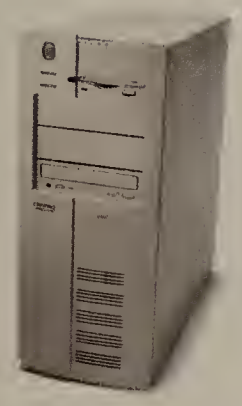
Compaq Professional Workstation 5000
Starting at $3,900.† (For models with 200MHz Pentium
Pro* processor, 32MB RAM and 2.1GB HD.) Free memory
offer†† (thru 4/30/97).** (Monitor sold separately.)

Compaq Netelligent Networking Products
Networking Interface Cards reduced up to 15%.*
Hubs reduced up to 44%.*
Switches reduced up to 35%.*
8500 Communications Platform reduced up to 40%.*

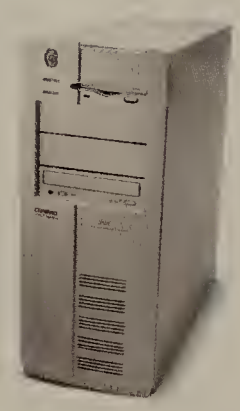
Compaq Deskpro 2000 Family
Starting at $1,149* for models with
133MHz Pentium* processor and 1.2GB HD.
Compaq V70 color monitors, starting
at $697,* sold separately.

Compaq Deskpro 4000 Family
Starting at $1,299* for models with
133MHz Pentium processor and 1.2GB HD.
Compaq P70 color monitors, starting
at $899,* sold separately.

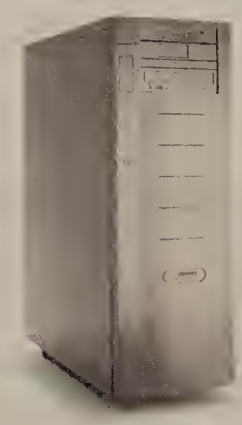
Compaq Deskpro 6000 Family
Starting at $1,999* for models with
166MHz Pentium processor and 1GB HD.
(Monitor sold separately.)



Compaq ProLiant 800
Free 32MB memory
module (thru 4/30/97).**



Compaq ProSignia 200
Free 16MB memory module
(thru 4/30/97).** Also available:
the ProSignia 300 starting at $1,333.*



Compaq ProLiant 5000/5000R
Reduced up to 11%.* Free additional processor with
purchase of ProLiant 5000 6/166 server (thru 4/30/97).**
Two-for-one 6/166 processor option kits (thru 4/30/97).**

Now available for all workstations and servers: 9.1GB Wide-Ultra SCSI hard drives reduced up to 10%.

To jump on this opportunity, find your local reseller at 1-800-853-9588, or visit us at www.compaq.com/us.

intel inside
pentium® PROCESSOR

'NET INSIDER

Old laws in new venues

Industry Canada has published an exhaustive (more than 300-page) examination of Internet content-related liabilities (http://strategis.ic.gc.ca/cgi-bin/dec/wwwfetch?/sgml/it03118e—pr115.sgml). Although the study takes into account the specific legal landscape of Canada, it explores, perhaps for the first time, a range of legal liability issues that are or may be exacerbated by the Internet.

The basic conclusion of the report is, as its title states, "The cyberspace is not a no-law land." If an activity is against the law in other venues, it is also against the law when carried out using the Internet as a transport or communications service. This conclusion has been noted before in this column ("Old wine in new bottles," *NW*, July 24, 1996, page 20), but bears repetition — the Internet creates no immunity from the law.

This was one of the points argued by the plaintiffs in last year's challenge to the Communications Decency Act (CDA). Specifically, they disputed that the CDA was not needed to deal with activities such as child pornography on the Internet. These activities are already illegal and transport via the Internet does not change that fact.

(I'm told that the government's appeal of the Philadelphia court's declaration that the CDA is unconstitutional "on its face" will have been heard by the U.S. Supreme Court by the time this column is published. The result of the review will be of great importance to the future of legitimate communication via the Internet.)

While conveying no immunity, use of the Internet can easily create additional complexities in trying to understand how existing law applies. For example, the individual who posts questionable material is not necessarily within the jurisdiction of the legal system that determines there is a problem with the material. This is not a new problem, but the Internet's aggressive nonrecognition of political borders makes this complication more likely to be a factor.

Scott Bradner

Also, as the report cautions, one must be "aware of the limitations of saying that the Internet is just like something else. All such analogies are, by their very nature, limited and incomplete. While an analysis can begin with an analogy, it is both bad policy and bad law to fail to go further and note the areas in which the metaphor fails, is incomplete or is misleading."

Politicians don't get it

The advent of the Internet has already inspired new legislation in many places around the world, some of it quite scary. Legislators seem to be congenitally incapable of understanding the global nature of the beast or the powers and limitations of the technology.

There will be a continuing need, therefore, to ensure that legislative bodies do not, in their zeal to put the Internet in its place, destroy the ability of the Internet to advance the commercial, political, educational and social needs of those who would use it.

Disclaimer: While there are a number of people at Harvard who think they know what they are talking about on this issue, I did not consult any of them. These are my own thoughts.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached via the Internet at sob@harvard.edu.

WHEN IT COMES TO ATM, IT PAYS TO FOLLOW THE LEADER.

FORE

Your migration path to ATM is fast and smooth—when your partner has completed the run thousands of times. FORE Systems developed the first commercial ATM solutions over five years ago. Today, FORE ATM networks are increasing productivity and decreasing network costs in thousands of major companies and institutions worldwide. Far more than *all* other ATM providers combined. So while other companies have ATM in theory, only FORE has a full suite of field-proven ATM networking and migration products *now*. Let the world's most experienced ATM company help you get ATM network performance off to a flying start. For your free *Guide to ATM*, just contact us at (888) 404-0444, info@fore.com or http://www.fore.com/ad/rowers

FORE SYSTEMS

Circle Reader Service #27

Special Focus

WEB SERVERS

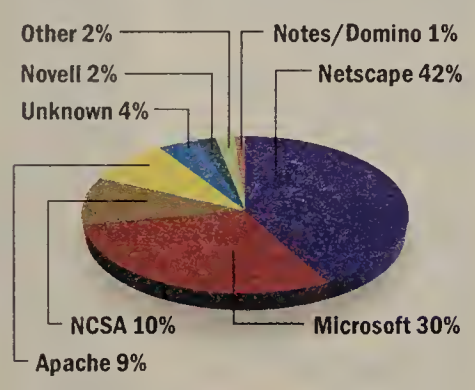
Web servers: Is free better?

By Carol Sliwa

John Hensley, the chief Internet engineer for NDS Software, Inc., wasn't so different from many of his peers when he set about creating an Internet site back in 1995. To power his company's HomeSeekers site, which would contain thousands of real estate listings, Hensley opted for the free Unix-based Web server software made available by the National Center for Supercomputing Applications (NCSA).

WEB SERVER USAGE: INTRANETS

Commercial software dominates the corporate Web server market.



Based on a survey of 356 corporate sites with a total of 3,462 servers.

SOURCE: ZONA RESEARCH, REDWOOD CITY, CALIF.

Whenever he had a problem or question, he'd send E-mail to a newsgroup or someone at the University of Illinois at Urbana-Champaign, the home of NCSA, in hopes that an answer would arrive in a timely fashion. But he never knew for sure.

"I felt like it was going off into a bit bucket, into Never-Never Land," Hensley recalls. "After doing that a couple of times and not getting any responses, you have this feeling of being alone."

That's one of the chief perils confronting freeware users. The benefits are clear. It's free. It works. It's fast. With the source code in your control, you can tweak the software to do whatever you want, adding or removing features and functionality.

But there's a catch. When disaster strikes, there's no company to call, and for some, that's simply too great a risk to take.

"When you're in a corporate environment, you expect software to be up and running, and if it's not, you want to have somebody to call," says Neil Fox, manager of advanced development and applied technology for Cleveland-based TRW, Inc., which switched to Netscape Communications Corp.'s Web servers after using NCSA software from late 1993 to late 1994.

Fox also likes the additional functionality he gets with Netscape's server software, such as a built-in search engine, intelligent agents, management tools, a development environment and support for the Lightweight Directory Access Protocol.

For Hensley, now a Microsoft Corp. customer, database connectivity is a concern. With Microsoft's new Active Server Pages, a component-based model for developing applications, he can use that server-side scripting mechanism to gain database access, relieving him of the more labor-intensive task of writing Common Gateway Interface applications.

"I definitely can say it's dramatically reduced my development time," Hensley says.

At issue: Security

Another big issue in the freeware vs. commercial Web server debate is security. Because of U.S. export control laws, the developers of the most popular freeware, the Apache Group, cannot include Secure Sockets Layer (SSL) support in their Web servers, according to Brian Behlendorf, an Apache founding member.

Behlendorf, who makes his living as chief technology officer of Organic Online, Inc., a San Francisco-based Web site development company, says Apache has no graceful way to distinguish which people downloading the software are from the U.S. But his group plans to try to define an abstraction layer so people can easily add SSL.

Apache builds fortress

In fact, Apache has lots of plans for its upcoming 2.0 release. Making the server more of a gateway to a generic set of services is one idea being tossed about, Behlendorf says. Another is making the core multithreaded.

"I think we've been as innovative [as the commercial developers]," Behlendorf says.

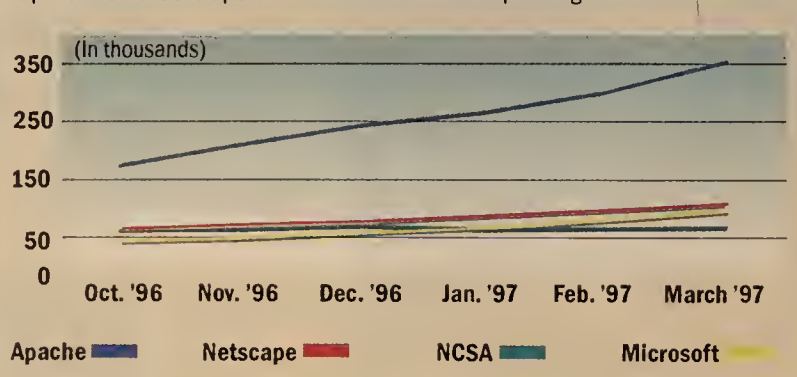
Behlendorf would like to dispel the myth that the Apache Group is just "a bunch of kids or hackers or anarchists." Although some hail from the academic world, most have a commercial interest in Web servers, he says.

As chronicled by Robert McGrath, an NCSA software developer who coauthored a book titled *Web Server Technology*, in the freeware world the European laboratory for particle physics research, CERN, was first to gain a significant foothold. NCSA followed with its own Web server, opting for a smaller, simpler implementation that did not use the reusable code library that CERN had created.

WEB SERVER USAGE: THE INTERNET

British company Netcraft surveys Web server usage on Internet-connected computers, polling as many host names at it can find with an HTTP request for the server name.

Top Web server developers with number of hosts responding



SOURCE: NETCRAFT, BATH, ENGLAND

When NCSA decided to drop its Web server development efforts, the Apache Group picked up the freeware mantle in the spring of 1995.

In fact, a number of programmers had been communicating electronically about the patch files they'd been working on to fix bugs and improve performance and security in NCSA's httpd 1.3 server. They decided to get organized under the name Apache Group in tribute to that initial patch file work.

An MIT graduate student, Robert Thau, did a rewrite of the NCSA code in the summer of 1995, and the group has been going strong ever since.

"The Apache server is a heck of a good piece of work," says Bob Denny, who authors the Web server software for O'Reilly & Associates, Inc.

And the source code can come in handy when problems arise, according to Bruce Welton, a Unix systems administrator with the Massachusetts Institute of Technology Artificial Intelligence Lab. An error message might not be descriptive enough, but with the source code readily available, McGrath says he can scope out the problem himself.

Double-edged sword

But having access to source code can be a double-edged sword, particularly for companies that rely on Web servers to perform key functions. On the one hand, Unix programmers can change the code to enhance the Web server's capabilities to suit their companies' needs. On the other, the corporation has to devote employees to maintain those Web servers.

"If that guy's not available, we are in hot water," says Kevin Redding, Pratt & Whitney's manager of Web development. "You have to have the IT staff to support freeware."

Specifically, you have to have Unix geeks. Freeware primarily runs on Unix right now, although plans are in the works for ports to other platforms such as NT, according to Behlendorf. The World Wide Web Consortium also has created a new free Web server, called Jigsaw, that's written in Java, McGrath notes.

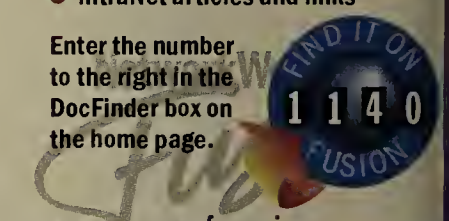
The current Unix flavor clearly has its devotees. Surveys done by a British company, Netcraft, Ltd., show that 43% of the 833,139 Internet sites it polled at the end of February are running Apache's free server. Netscape is No. 2 at 13%, and hard-charging Microsoft, which bundles its Internet Information Server with NT, is approaching 12%. And even though it's no longer being supported, NCSA's freeware still holds fourth, at 9%.

Critics argue that the Netcraft statistics don't take into account servers running behind firewalls on intranets. They also point out that Netcraft polls every known site, from the Web server sitting on some college student's desktop to large corporate sites.

Jump onto Fusion for more:

- **A survey about the products most used on the 'Net**
- **Free downloads of Web server software**
- **IntraNet articles and links**

Enter the number to the right in the DocFinder box on the home page.



Don't do what I do

But freeware has some noteworthy users, including some of the vendors who develop their own Web server software. Novell, Inc., for instance, is still using a fair number of Apache, NCSA and CERN servers.

Company policy calls for Novell to use its own technology as quickly as possible, according to Novell brand manager Richard Ling. But that hasn't been easy. Novell's Web server runs only on NetWare and IntranetWare, and the company is still running its former product, UnixWare.

"Migrating has turned out to be a little harder for the IS department than we thought it would be," Ling says.

As companies start using their Web sites for business-critical purposes, they're getting more and more selective about their software, Zona Research says.

"They're starting to bank their businesses on these products," says Harry Fenik, a Zona vice president. "And most enterprises are reluctant to do that on freeware products. If you think about it, I don't blame them." ■

Lotus® Domino™ Server ■ DB2® Database Server ■ Internet Connection Server ■ Communi-cations Server ■ Transaction Server ■ Directory and Security Server ■ Tivoli™ Management Server ■

In Canada, call 1 800 IBM-CALL, ext. 8405. The IBM home page is located at www.ibm.com. IBM, DB2, OS/2 and AIX are registered trademarks and Solutions for a small planet is a trademark of International Business Machines Corp. Lotus is a registered trademark and Domino is a trademark of Lotus Development Corp. Tivoli is a trademark of Tivoli Systems, Inc. *Windows NT is a registered trademark of Microsoft Corp.

@

IBM Software Servers solution No. 1 of a series

Building a Website for your business is easily within your reach.

Establish your presence on the Web with the help of Lotus Domino, powered by Notes. It lets you easily set up an interactive Web server. So your customers and employees can use the Web to communicate and collaborate anytime, anywhere.

+

IBM Software Servers solution No. 3 of a series

Use Internet commerce to boost your sales and customer base.

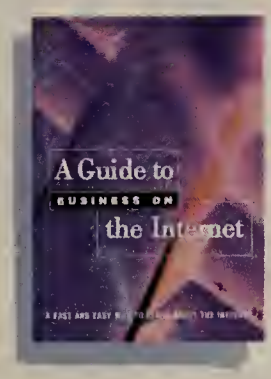
Selling your products on the Web exposes your company to millions of new prospects. And risks. IBM Software Servers help you reduce those risks. They provide a secure environment for processing confidential information such as invoices and credit cards.

#

IBM Software Servers solution No. 7 of a series

Analyze data so deeply, you're able to conquer new ground.

Transform piles of data into nuggets of vital customer information to help you make smarter, quicker decisions. For instance, access a data warehouse from the Web or your company's intranet with our DB2 Database Server. It's completely scalable and runs on Windows NT,* OS/2® and AIX.®



It's easier to solve your business problems when you've got a number of options.

☎

Call 1 888 200-5671, Priority Code ZXP6E011

@

Visit us on the Web at www.software.ibm.com/info/sn1/

Taking advantage of the Internet is one of the smartest options you have. To find out why, simply call or visit our Website for a free copy of *A Guide to Business on the Internet*. IBM and their Business Partners can take you beyond the Net to help you create a more competitive and flexible business environment.

Solutions for a small planet™

IBM®

MIND-BLOWING

Two-for-One Port Pricing* Extended Through May 30, 1997

Before You Buy Shiva, Cisco or Bay...

Think Twice!

Now through May 30th, we'll match our competitors' best access server price* and give you double the ports... GUARANTEED.

Two-for-One Port Pricing...
Only From Access Beyond.

For a limited time, Access Beyond will match any Shiva, Cisco or Bay access server price* and double the number of ports...guaranteed. They say four, we give you eight. They give you eight, we give you sixteen. Same price, twice the ports. It's that simple.

Think about it. Access Beyond's Servers combine more features, more performance and ease of use with exceptional security and management to deliver maximum capabilities at twice the value.

What's more, Access Beyond delivers support for IP, IPX, Appletalk, PPP, SLIP, Radius, XTACACS, SecurID, Netware Bindery, PAP/CHAP, Dialback, Telnet, NACS/NASI, DHCP/Bootp...everything needed for complete access. Plus a point-and-click SNMP Management System that you'll master-mind in moments, not weeks. All the features – twice the value.

So why settle for half the access for the same money? There are no gimmicks, no risks. Just better performance, better features, and twice the ports. And if you're not completely satisfied, just return it within 30 days for a complete refund. That's real peace of mind.

Just call (800) 456-7844, ext. 8801, for all the details on Access Beyond's Two-for-One Port Program. We make total access a no brainer.

ACCESS BEYOND

THE NEW STANDARD FOR MILLENNIUM III

1300 Quince Orchard Blvd., Gaithersburg, MD 20878, USA
800-456-7844 or 301-921-8600, ext 8801
http://www.accessbeyond.com

Circle Reader Service #22

United Kingdom: Access Beyond, Ltd., 5 Stable Court, Herriard Park Estate, Herriard, Basingstoke, Hampshire RG25 2PL, United Kingdom, Phone: (44) 1256 381800, Fax: (44) 1256 381884

*Does not apply to promotions, giveaways or special pricing. Please call for details.

NUTTER'S NETWORK HELP DESK

Ron Nutter, a Master Certified Novell Engineer and Groupware CNE in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 476, or send your questions to rnutter@world.std.com.

We are looking for a second server but can't figure out whether to use duplexed hard drives or RAID 5, as Compaq Computer Corp. recommends. It seems to me that duplexed hard drives, which is what we use for our existing server, will cover a controller or hard drive failure better than RAID 5. What do you think?

Via the Internet

RAID 5 is useful when you need a logical volume size that is larger than one drive can provide, but don't want to risk losing the entire volume if one drive fails. Per megabyte, it is less expensive to build a large drive subsystem than a duplexed configuration.

Compaq's RAID 5 controller lets you add drives in the open slots of an expansion cabinet without powering down the system and without having to restore the system from tape backup after the drive has been added to the array. If this isn't good enough, you can construct a RAID 10 system that consists of duplexed RAID 5 controllers.

Duplexed controllers will cover a drive or controller failure at less cost than a typical RAID 5 installation. But with a duplex configuration, you need to add a step that isn't covered in the manuals. I install the DOS boot partition and make it bootable on both drives. I then create the SYS: volume on each drive, install the NetWare patch kits so the appropriate patch files reside in each drive's DOS partition, delete the SYS: volume from one of the drives and then set up the duplexing.

The way Compaq controllers work, you can't see the DOS partition from both drives at the same time. This configuration will allow you to take the system down, remove the failed drive and bring the system back up without any changes.

It comes down to how much you're willing to spend for security. Duplexing is sufficient for most installations, but RAID 5 is certainly an option, especially with the drop in drive prices in recent months.

Standard paves the way for multimedia conferencing over packet-based nets

The ITU-T's H.323 standards make desktop conferencing more plausible.

By Jack O'Neil

The validation of the H.323 conferencing standard is opening the door to seamless integration of multimedia desktop conferencing on existing corporate networks, including LANs and intranets, or over the Internet.

Prior to H.323, the standard of the International Telecommunication Union's telecommunications standards division, companies that wanted standards-based conferencing relied on H.320, another ITU-T standard. Although H.320 boosts conferencing because it allows for multivendor interoperability, it is in some ways limiting.

This is because most H.320-compatible systems work only on ISDN Basic Rate Interface lines, allowing 64K or 128K bit/sec conferencing. Companies must supplement the existing network infrastructure with ISDN connections.

A more robust standard, H.323 allows companies to load conferencing applications on existing network connections. Extending the network over the Internet is a bonus, but the vital enabling technology is the simple, internal setup procedure that allows the building of a multimedia network around the existing infrastructure.

Shared bandwidth

H.320 utilizes ISDN or a circuit network so bandwidth can be dedicated to users for the duration of the conference call. But on IP-based networks, because bandwidth is shared among users, the timing of conferences can be problematic. Some packets may be delayed in transmission.

The ITU-T developed H.323 to define how a multimedia terminal functions on a packet network that does not guarantee quality of service — in short, how to conference over a LAN, an intranet or the Internet. The H.323 standards suite covers areas such as audio transmission, data conferencing, multiplexing and reverse multiplexing, and control.

H.323 is not tied to IP, but it seems most H.323 implementations will be based on IP because of the rise of that protocol within corporate network environments.

H.323-based products will hit the market in a couple of months. They are expected to rapidly replace proprietary technologies for conferencing over LANs and the Internet.

Multiple vendors, including Intel Corp. in its ProShare products and Microsoft Corp. in NetMeeting, have committed to supporting the H.323 standard. The ITU-T has been hosting a series of tests to ensure interoperability among disparate H.323-compliant products.

Using the stack

H.323 uses the User Datagram Protocol (UDP) for the audio/visual media and TCP for data. UDP is less reliable than TCP but offers lower latency, making it a good match for the audio and video streams.

For voice and video, low latency is more important than error correction.

Timing and jitter control make or break live audio- and videoconferences. If timing is off, for example, the result will be warbling and pitch changes during the conference. Loss of some packets is not disastrous for conferencing applications as long as timing can be reconstructed.

H.323 conferences rely on the Real Time Protocol (RTP) sitting on top of UDP to keep the audio and video synchronized. In effect, RTP time-stamps every outgoing packet.

At the receiving end, timing relationships are reconstructed. There is some delay — up to one-quarter of a second — but the time stamps on each packet tell how to play them back, consistently spaced in time.

This allows recovery from network-introduced jitter or timing skew.

While RTP should suffice, users can take advantage of the Internet Engineering Task Force's Resource Reservation Protocol if they want to guarantee bandwidth for the conferencing application.

Gaining gateways

At some companies, H.323 and H.320 conferencing standards can both play a role in conferencing systems. H.320, for example, might be used for a room system and H.323 could be used at the desktop.

Therefore, some vendors are planning gateways that allow H.320 and H.323 systems to communicate. Cisco Systems, Inc., for example, has announced plans to incorporate Video-Server, Inc.'s conferencing technology in its routers. Stand-alone gateways also will be available.

The H.323 conferencing standard is one of the first steps toward widespread multimedia desktop conferencing.

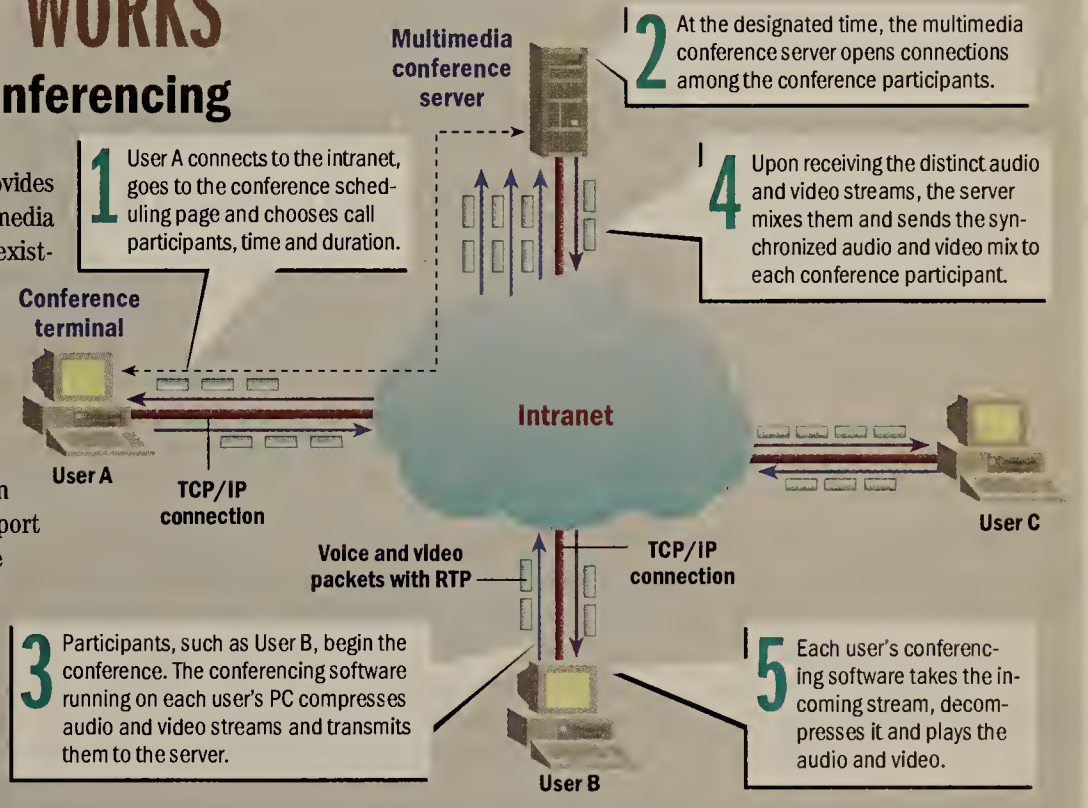
Once the standard takes hold, it will provide a firm foundation for growth and pave the way for meeting the escalating demand for versatile, flexible and robust methods of collaboration.

O'Neil is vice president of marketing at VideoServer, a Burlington, Mass., company that makes servers for multimedia conferencing. He can be reached via E-mail at joneil@videoserver.com

HOW IT WORKS

H.323 conferencing

The ITU-T's H.323 standards suite provides a way to run multimedia conferences over existing corporate networks or the Internet. For the conference depicted here, H.323 relies on the User Datagram Protocol for transport and the Real Time Protocol (RTP) to handle the audio and video applications.



EDITORIAL *insights*

More Unix woes and some advice for Novell's new CEO

In July, I slammed Unix vendors for lying down on the tracks in front of the Windows NT train. In the face of growing marketing pressure from the Northwest, Unix vendors were huddling quietly in the background, saying virtually nothing while big customers were left wondering about Unix's fate.

What has happened since then? In a word, nothing.

The key Unix players have done little to stem NT's inroads in mindshare and marketshare. In fact, companies such as IBM and HP seem more intent on pushing their new Intel product lines.

It has gotten so bad that one of the leading companies, Sun Microsystems, is reluctant to be associated with the word "Unix." In an interview last week, Sun President Ed Zander said, "I don't use the word 'Unix' anymore. It doesn't mean anything anymore. [The other companies] abandoned it. They all gave up."

In Zander's view, Digital, HP and IBM "caved" to Bill Gates by embracing NT, and they are paying the price. "I look at companies that threw away what they were good at to draft behind Microsoft and Intel. All I see is less profit, less results," he said.

Zander's strategy is to keep Sun's attention squarely focused on improving the price and performance of systems based on Solaris, Sun's Unix, and getting customers to buy into the Java-centric view of network computing. "There are only two ways to go in life," Zander said. "Either you believe in your strategy and execute it well, or you go to NT. If I throw all of my energy and all of my people's energy into this every day, I have a better shot than. . . some of our competitors saying, 'How do I embrace NT?' That's going in the wrong direction."

For better or worse, Sun stands as a real alternative to Microsoft, and I hope Zander's former colleague Eric Schmidt, newly named CEO of Novell, takes his words to heart. Like the Unix vendors, what Novell needs is a message to inspire customers, not a lukewarm pitch about how NT and IntranetWare can coexist.

Sure you have to integrate with NT. But tell me how IntranetWare will be better than NT, how it will be the best platform for Java-based Internet and intranet applications, how it will advance the cause of network computing in ways NT can't. In short, offer a solid alternative. Don't just tell me how you can play in Microsoft's game. Define a unique path and commit all Novell's resources to it.

Customers are backing Schmidt; they've invested in the company and welcome this reinvigoration at the top. Unix users are also loyal. They understood the value of network computing before most other customers. But my question from July still lingers: Will Unix wake up?

For the full text of the Zander interview, enter 1224 in the DocFinder box at www.nwfusion.com.

John Gallant, editor in chief jgallant@nww.com

Global Telecom Reform • Ron Higgins

Internet may suffer as U.S. telcos eye global markets

For U.S. corporations adopting the Internet for business-critical applications, the World Trade Organization (WTO) telecommunications services agreement could not have come at a worse time (*NW*, Feb. 24, page 1). The WTO's liberalization of global telecommunications markets threatens to widen the rift between voice and Internet data communications in the U.S. at a time when the Internet, plagued by chronic lack of bandwidth, can least afford it.

The 69 WTO dignitaries and regulatory officials who met in Geneva last month to open more than 95% of the global telecommunications market have indeed accelerated the pace of development in regions that most need it.

Southeast Asia, Africa and Latin America will benefit greatly from the advanced telecom systems they will ultimately enjoy in the free-market scramble for their business. Whereas only 17% of the world's telecommunications markets were open to U.S. carriers before the new accord, nearly 100% will be available to the regional Bell operating companies and Big Three long-distance carriers as the WTO pact takes hold. Champions of the agreement say the average cost of an international phone call will drop 80% over the next few years, to a low of about 10 cents per minute in industrialized countries.

As the U.S. telephone companies make a mad dash for newly opened international markets, it's impossible not to think that investments in the U.S. Internet infrastructure won't suffer.

Currently, approximately 80% of all Internet traffic occurs in the continental U.S., but almost 100% of all the data passes through a complex interconnection of networks that contain at least one U.S.-based network access point belonging to a major U.S. telecommunications provider. Today, with approximately 30 million users, the Internet is already experiencing brownouts. In the U.S. alone, the number of Internet users is expected to grow to 200 million over the next five years as the World-Wide Web explodes into both the global marketplace and town square.

Domestically, U.S. telcos are already under siege, sparked by the Telecommunications Act of 1996. Suddenly, local monopolies are open to long-distance interlopers, and long-distance business is being ravenously eyed by the RBOCs.

At the same time, cable operators have abandoned the telcos' voice and data markets to focus on their core business in order to reduce multibillion-dollar debts accrued from megamergers. As the cable operators withdraw to their lairs, the telcos have no choice but to exploit the extraordinary opportunity for the video dial-tone market.

And Europe beckons, as well. Beginning Jan. 1, 1998, Europe is expected to be largely deregulated. Some RBOCs have already established beachheads there, and the WTO, through its recent move, will only accelerate Europe's massive telecom reform. Imagine how anemic the Internet infrastructure is likely to become as U.S. telcos begin to direct resources to a deregulated global marketplace. It can only mean that the "World-Wide Wait" will become longer and longer.

More than ever, corporations will need to apply pressure to their carriers to ensure adequate bandwidth for the emerging networked economy on the Web or find an alternative global network solution. Data conferencing and videoconferencing, electronic commerce, IP phones and other "killer applications" are ready to explode into new business paradigms, but only if there is adequate global bandwidth.

The telcos certainly have an obligation to their stockholders to secure ripe, new markets, but not at the expense of the new Internet networked economy. Ten cents per minute for a call from New York to Paris will certainly come in handy as we chat with our friends and associates, killing time waiting for a Web page to download.

Higgins is president and chief executive officer of Honolulu-based Digital Island, Inc., which provides a managed star extranet for the worldwide delivery of digital content and applications. He can be reached at (808) 540-4000 or via the Internet at ron@digisle.net.

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, *161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.*

Gigabit thoughts

I enjoyed reading Kevin Tolly's "Gigabit ruminations" (March 3, page 16). The questions explored were reasonable, the analysis thoughtful and the explanation good.

On a subject like Gigabit Ethernet, it's more valuable to have an article with some depth than a summary of the latest vendor developments or a press release. Columns such as Tolly's make plowing through trade publications more worthwhile.

Darrell Jones, lead system programmer
Regional Information System
Eugene, Ore.

Cisco: The new company we love to hate

Cisco Systems, Inc.'s reported attempts to stonewall the Internet Engineering Task Force's Tag Switching debate (*NW,* Feb. 17, page 1) raised some troubling questions. Did Cisco really do it? Do reporters have a right to publish a company's private E-mail?

However, the real question is whether we've built a public relations billboard around network reality that's so high and broad we can't see truth anymore.

OK, it's troubling that Cisco would write something that suggests it's just marking time in the IETF. But is such a message really a reliable representation of Cisco's corporate intentions? Why would Cisco submit a standard to the IETF only to derail the process so the company could publish its own version of Tag Switching?

The only answer can be that Cisco believed the standards process was so important from a public relations perspective that it had to play along with the IETF forum to stand tall with the trade rags.

Vendors are businesspeople, and business means selling your products. How many of us believe that just prior to the submission of a concept to a standards body, a group of businesspeople sit at a table and say, "Gee, for the good of humanity and the advancement of our noble art, we should put aside profit-making motives and donate this concept to the public domain."

Get real. Vendors decide to standardize something if they don't think they can make as much money on the concept if they promote it in a proprietary form.

I count myself among the many who believe Cisco is in no hurry to come up with a way to make ATM do routing or reduce the role of routers in large networks. It would be surprising, given Cisco's dominant position in the router market, if the company behaved otherwise. I also count myself among those who believe Cisco probably is dragging out the process. Why not, if it's good for business?

The question, then, is whether standards bodies should be used as foils for competitive interests. Well, whether they should or not, it is we reporters, editorial writers and analysts who have made it happen, not the vendors. Everyone knows that getting your company on the front page of trade publications helps sales. If everyone also knows that saluting standards helps propel your story toward that front page, what do you think will happen? The number of salutes will threaten to create a whirlwind.

All this probably happened because Ipsilon Networks, Inc. put its IP Switching specifications up on the Internet as an informational document. Cisco, looking to trump Ipsilon's public relations ace, decided to submit Tag Switching as a formal standard, ceding control on the specification to the IETF.

Was Cisco cynical? If so, then so was Ipsilon, and so are many other organizations — from Toshiba Corp. to IBM — that submit drafts that may represent product intentions.

A pox on all their houses? If we say that, nobody will submit anything, and the wonderful technical resource of the Internet as a forum for discussion on evolving technology and techniques will dry up.

A pox just on Cisco's house? That doesn't seem any more fair than what we're accusing Cisco of doing. In fact, Cisco has submitted a new proposal to the IETF, one that changes the original Tag Switching to make it more like the Aggregate Route-based IP Switching proposal IBM submitted to the IETF last November. Cisco's proposal, which it calls "VC merge," represents a concession on the company's part — the only significant concession made so far in the Tag Switching debate. If slowing progress were the only motive of Cisco's IETF activities, why submit something that promotes consensus?

So if Cisco has nothing to gain by submitting Tag Switching to the IETF and then changing its own position to build broader vendor acceptance, why is everybody beating up on it? Maybe the answer is more sinister than the questions. When Cisco was a little company, everyone in the media loved it. Cisco isn't little any more. Lots of people like babies and aren't too thrilled by what they turn into. Let's face it, we're an industry that sees size and success as threatening.

It seems we are seeing a changing of the guard in networking: You can tell who the top dog is by watching who gets the lousy press. IBM was renowned for its bad press image — nobody likes Goliath, I guess. Has Cisco's emergence as a company we love to hate proven that people now think Cisco, and not IBM, is the incumbent?

Bigness doesn't make badness (nor, obviously, is the converse true), particularly when most people my company has surveyed believe that none of these new switched IP technologies is going to displace routing until well after the year 2000. Suppressing progress is certainly a problem if the buyer is expecting it, but how much do we really know about these IETF positions? Who is proposing what? What would the differences be to the user?

If there's truth in networking, as opposed to truth in business, then only a debate on issues will find it. Isn't it more important to understand the benefits of a technology than its politics? If vendors are at loggerheads over an issue in the IETF, and if that stalemate is stalling forward motion, let's debate the issue. If there's no substance to it, *then* it's time to start looking for ulterior motives.

Nolle is president of CIMI Corp., a technology assessment firm located in Voorhees, N.J. He can be reached at (609) 753-0004 or via the Internet at tnolle@cimicorp.com.

Kevin Tolly's column about Gigabit Ethernet missed a few key points.

First, he says there isn't a need for all that bandwidth. When Bob Metcalfe and company whipped up Ethernet, 10M bit/sec was fantastically fast compared to what most computers of that day needed; that was the key to its longevity. Fast Ethernet is an order of magnitude faster than regular Ethernet, but how long does it take before processing speed, or program size or data size grows by an order of magnitude? Remember when a word processor came on one floppy disk?

Gigabit Ethernet may be more than we need today, but network managers who put in just the network infrastructure they need today will be looking for a job soon. Second, Tolly claims that ATM is a more standard, better solution, which "clearly excels" at campus backbone applications. Really? ATM compatibility between vendors is still problematic, and while Fast Ethernet is similar in most respects to standard Ethernet, ATM is a whole new world.

Gigabit Ethernet standards are a year or so off, but ATM has standards today — lots of them. Choose Multi-Protocol over ATM, classical IP over ATM or LAN emulation and start chopping those packets into cells.

ATM has a home, but it is on the wide-area network where bandwidth is expensive and it makes sense to run voice, video and data in the same pipe. Today, LAN traffic is better served by keeping data in packets and using a judicious mix of shared, switched and routed networks with appropriately sized pipes. Gigabit Ethernet will soon be another good tool in the mix — sooner than most folks think if the rapid acceptance of Fast Ethernet is any indication.

Karl Compton, vice president for network engineering
Cierra Solutions, Inc.
Houston

Inappropriate term

In his column "If governments act appropriately..." (Feb. 10, page 28), Scott Bradner uses the term "schizophrenic" to describe the U.S. government's draft document outlining a framework for global electronic commerce.

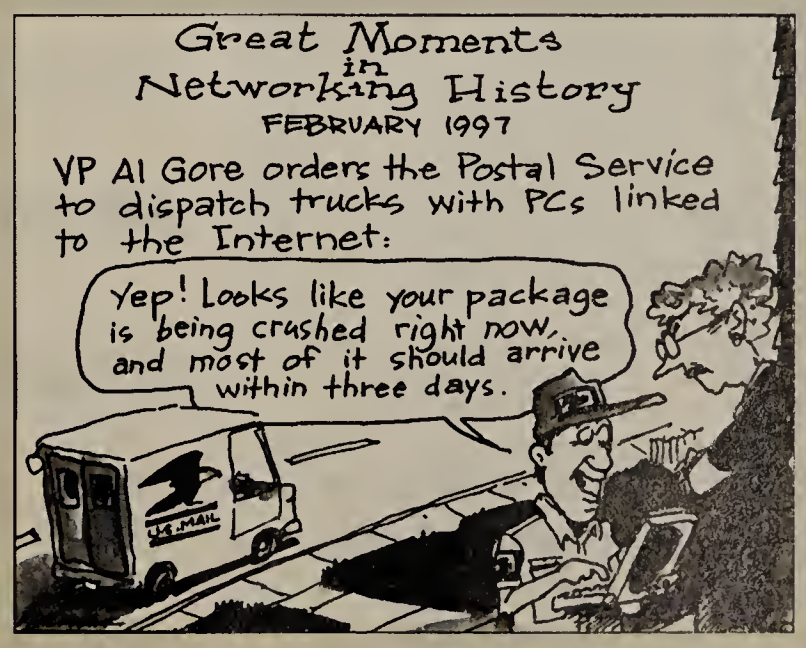
Although I am not among the millions who suffer from this common mental illness, I am concerned when writers use this term to describe contrasting or conflicting opinions or behavior.

Despite popular misconceptions, schizophrenia is not a dual-personality disorder; it is the common madness we see wandering the streets every day characterized by irrational behavior, delusions, paranoia and so forth. The definition of schizophrenia does not fit Bradner's usage, metaphorically or otherwise.

Perhaps schizophrenic should be included among those words that thoughtful, sensitive writers and editors instinctively avoid.

Toby Jessup, principal engineer
US WEST Interprise
Networking Services
Seattle

Teletoons



NetworkWorld
TECHNICAL SEMINARS

NEXT GENERATION MESSAGING

Capitalizing on Internet & Client/Server E-mail

Enterprises across the world are eager to capitalize on Internet and client/server E-mail as a universal infrastructure utility for supporting vital groupware and electronic commerce applications. However, neither monolithic proprietary mail systems nor yesterday's shareware mail packages can successfully support high-volume, mission-critical applications on your Intranet, Extranets, or the Internet at large.

Internet and client/server messaging systems are based on proven yet dynamically evolving standards. Thanks to the wide acceptance of the standards, intense user demand, and strong vendor leadership programs, Internet and client/server mail products are becoming more robust and flexible. Through the smart deployment of messaging products that add value in the areas of standards, security, directory, management, and applications integration, enterprises can build sustained competitive advantage in a cost-effective manner.

Capitalizing on Internet & Client/Server E-mail will help you decide what services you need from client/server Internet messaging, and what benefits your company can expect from upgrading to the latest standards and technologies. You will learn how, when, and why to deploy products supporting new standards like Multipurpose Internet Mail Extensions (MIME), Internet Message Access Protocol 4 (IMAP4), Extended Simple Mail Transfer Protocol (ESMTP), and the Lightweight Directory Access Protocol (LDAP).

This seminar, taught by Daniel Blum of Rapport Communication, a leading expert in messaging, will also cover best practices for evaluating and selecting messaging products, lowering cost of ownership, migrating from legacy mainframe or LAN E-mail systems to client/server messaging systems, and sending information securely over the Internet. It covers tricky deployment issues, such as how to use mailing lists, message switching backbones, X.500, directory synchronization, and mail monitoring software.

Capitalizing on Internet & Client/Server E-mail will provide you with the information and insight necessary to more efficiently and effectively implement and manage your messaging infrastructure.

16 BENEFITS OF ATTENDING!

1. Anticipate and profit from key Internet/Intranet next generation messaging trends
2. Leverage open POP3/IMAP4 and LDAP access protocols
3. Configure a robust SMTP/MIME infrastructure
4. Understand major vendors' messaging product programs, and how to manage and maximize your investment in these offerings
5. Harness the messaging infrastructure for web-based mail and collaborative applications
6. Plan directory integration using LDAP, X.500, and meta-directories
7. Practice "safe messaging" using PGP or S/MIME
8. Assess "do's and don'ts" message-based electronic commerce
9. Analyze vendor product positioning
10. Evaluate Internet service provider (ISP) messaging connectivity or management support for small, mid-sized, and large enterprises
11. Understand and take advantage of different product/service pricing structures
12. Follow best practices for messaging administration, help desk, and management
13. Use proven methodologies for planning strategy, migration, procurement, and deployment
14. Define performance measures and service level expectations to maximize end user satisfaction
15. Master the intricacies of interconnecting standards-based and legacy messaging systems through gateways
16. Time-saving tips and pointers to valuable messaging information resources

REGISTER AND YOU WILL RECEIVE . . .

- Comprehensive Seminar Workbook
- Exclusive Network World Resource CD-ROM
- Free 3-month trial subscription to *Rapport Messaging Review*, the premier industry newsletter covering the business and technology of electronic messaging
- Luncheon and break refreshments
- All of the above included in your $450 registration fee

Note: If you can't attend, call us and order this informative and useful attendee materials kit for just $99!

Sponsored by:

digital
Novell.
CONTROL DATA
The Integration Company
Worldtalk
Microsoft
WILTEK
We Get Your Message Across

If you are interested in sponsorship opportunities, please call 508/820-7520.

DATES & LOCATIONS

5/29/97	New York, NY
6/3/97	Irvine, CA
6/4/97	San Francisco, CA
6/5/97	Seattle, WA
6/10/97	Boston, MA
6/11/97	Washington, DC
6/24/97	Chicago, IL
6/25/97	Atlanta, GA
7/22/97	Philadelphia, PA
7/23/97	Dallas, TX

Dial Our **FAX-BACK** Information Line at
1-800-756-9430
for a complete seminar outline and registration form.
When prompted, request document #70.

Call 1-800-643-4668
Register today for the seminar nearest you!

Web/E-mail Information
Obtain full seminar information and register on-line in the Seminars/Events section on Network World Fusion.
www.nwfusion.com
OR
send a request to
seminars@nww.com
Please put the word "EMAIL" in the subject field.

Feature

10 TIPS FOR BUILDING AN ATM NET

By Cathy Gadecki and Christine Heckart

You've likely been hearing and reading about ATM for a number of years now. Perhaps you're toying with the idea that ATM can solve some real problems in your network. You want to be sure but aren't quite certain how to proceed.

It may be time for you to initiate your own ATM evaluation. To help you succeed, we've assembled this list of 10 ATM project tips — practical advice that will help you ensure ATM is a good fit for the problem you're trying to solve, avoid project delays and, ultimately, get your project off the ground.

1 Think small to start

We can't overemphasize the importance of keeping your initial project small. Because ATM targets such a broad span of networking environments and applications, many early adopters sought to implement ATM anywhere and everywhere in the network. The result was large and complex projects that had no hope of getting past the blueprint stage.

Your first project needs to be one you can readily budget, design, install and maintain. Limit the project scope somehow: Choose just one networking environment, reduce the number of supported applications or decrease the number of locations and users.

Don't fall into the trap of scope creep in hopes of cost-justifying your project. The result may be a project with a hefty payback but also so much excess baggage that it never gets off the ground. The challenges of finalizing the network design, selecting all the vendors and defining a practical implementation plan bog down large projects until they eventually sink out of sight.

If you must define a large, ambitious project to justify ATM, at least break it into small, manageable phases. Give yourself enough time in each phase to completely chew and swallow before proceeding. You are going to need time to scale all the new learning curves in ATM, from planning and engineering to actual operation. You can use knowledge gained from the inevitable mistakes to improve the plans for your remaining phases. The best initial project focuses on one demanding desktop application, a few congested campus backbones or a handful of large WAN sites.

2 Have good reasons why ATM beats any alternative

Don't jump headfirst into ATM without considering the alternatives. Other technologies are rapidly replicating the scalability, quality of service (QoS) and service integration benefits that were once the exclusive domain of ATM. Depending on your project, these emerging alternatives may offer you an easier implementation or lower cost than ATM.

Choosing the best technology for your network comes down to how you prioritize the following factors:

- Cost per desktop or per location
- Available bandwidth per desktop or per location
- Support for time-sensitive traffic
- Ease of operation and maintenance
- Ease of integration into the existing network
- Interoperability with other vendors or technologies
- Future capabilities

If after evaluating the potential alternatives you are sold on ATM as the right choice for your project, identify a few of the most compelling reasons to sell the ATM solution to the rest of your organization.

3 Establish clear objectives for your ATM project

Because ATM projects easily succumb to scope creep, you can quickly lose sight of what you initially set out to accomplish. A well-defined list of specific objectives and outcomes for your project can help keep you on track. You'll have a clear understanding of what's most important if you benchmark each of your alternatives. You'll also know when your project is meandering away from its initial intentions.

4 Establish long-term networking goals

Because ATM will probably remain a part of your network for several years, you'll want to also give some consideration to the direction your network should head. How are the applications and traffic going to change? Is the use of existing applications shrinking or growing? What new applications may arise? Will they have different networking requirements such as real-time communications? What traffic patterns do you expect from these applications: client-to-client or client-to-server? How rapidly are the costs for your network growing?

5 Do some comparison shopping

Getting your hands around the new costs and savings of an ATM project is one of the most difficult and yet important steps. Projections for wide-area costs are especially difficult because of the lack of public ATM pricing and the volume discounting of most existing telecommunications contracts.

Be aggressive when asking for ATM pricing quotes, especially from carriers that tend to initially give you their highest list pricing.

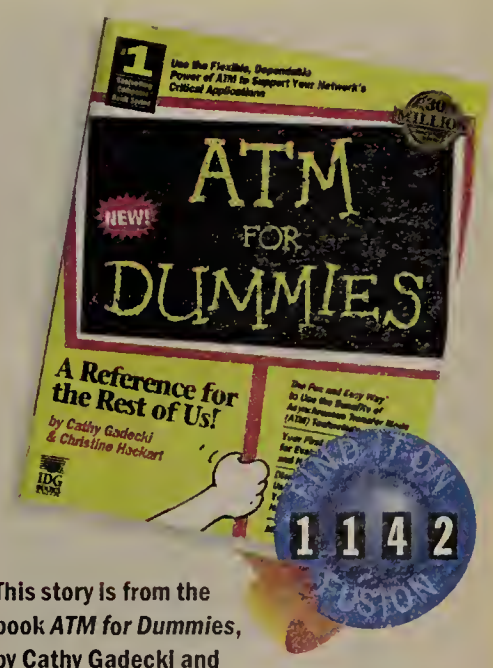
Determining the appropriate growth factor for your network is essential to making the right decisions. ATM is easiest to justify when it is necessary to support the existing day-to-day functions of the organization. In our experience, we have found that network managers tend to underestimate the growth deluging their LANs and WANs.

Early in the project's life, you'll want to run an initial check of the dollars needed for each of your potential solutions, including the expense of maintaining the status quo. You may find the expense of ATM or another solution knocks it out of the competition early.

Items to consider on the savings side of an ATM solution include:

- **Wiring** — New wiring can be extremely expensive and disruptive to the business, sometimes even impossible if you must cross public rights-of-way. ATM can increase utilization of the bandwidth your existing wiring supports by sharing it among many different data applications and perhaps even video and voice.
- **Local access costs** — Only one ATM access link is necessary at each network location, compared with private lines, which generally require multiple lines at host locations and redundant links to other key sites. In the future, ATM could allow integration of many service types into a single access facility, but first the carriers must interconnect their new ATM networks with their existing networks.
- **Wide-area bandwidth** — The greatest potential for savings with an ATM network is in the cost of wide-area bandwidth. If you have a multimillion-dollar long-distance bill each year, you should consider the potential savings of deploying ATM in your backbone network. As on the local networks, ATM can increase bandwidth utilization by allowing many applications to share the same resources. If you use public ATM services as opposed to private networking, the sav

See ATM, *page 54*



This story is from the book *ATM for Dummies*, by Cathy Gadecki and Christine Heckart, available now from IDG Books Worldwide. Check out Network World Fusion for more on the book, including a complete list of chapters and information on where the book is available.

Products To Keep Your Network Up And Running. Versus You, Up And Running.

Sit back. Relax. This will be easy. Deployment. Integration. Easy. Fast. We have Compaq Netelligent products for Ethernet, Fast Ethernet, FDDI and Token Ring environments.

Netelligent NICs and hubs plug easily into existing networks without having to lay new cable. And this protects your investment. You'll find that all Netelligent products are based on industry standards for guaranteed compatibility with existing industry-standard hardware. (For example, Compaq Netelligent Management Software is a tool that comes standard with all Netelligent manageable hubs, switches and routers for managing the entire network.) As far as price:performance is concerned, our Smart Uplink hub feature is the industry's only standards-based solution. Smart Uplink extends the distance limitations of deploying Fast Ethernet without adding costly bridges or routers. This means, in the end, everyone will get along simply and famously.

The Compaq Netelligent line of products includes NICs, hubs, switches and routers.

The reality is that people want fast access to information. You want to give it to them. With Compaq and its broad range of networking products, we can help you provide that fast access. Without having to wear running shoes. Unless you want to. For more information, visit our web site at www.compaq.com or call 1-800-544-5255.

COMPAQ

Has It Changed Your Life Yet?

You know you're ready for ATM if. . .

How do you know whether you should be considering an ATM project? Look for yourself in our list of favorite candidates.

- ATM is a solid choice as a backbone technology for service providers — both traditional carriers and Internet service providers — although ATM switches in ISP backbones may eventually use IP switching solutions for traffic control.
- ATM is emerging as a good solution for campus backbones that need speeds greater than 25M bit/sec. These backbones include direct, high-speed connections to servers. ATM offers strong price/performance value and the strategic carrot of positioning the enterprise for future multimedia communications.
- Over time, the largest enterprises will discover that adopting ATM for the wide area can be cost-effective. Other organizations will have ATM to their doorstep through a native LAN or managed service from their carrier, although the customer may be unaware that ATM is sitting on its doorstep.
- ATM can be a good solution at the desktop for high-powered workgroups, especially if multimedia is a known future application. Prices for network interface cards will continue to tumble, closing the gap with other solutions. If you already have Ethernet cards on your desktop for a shared LAN, your best bet for a performance upgrade is switched Ethernet, unless you need much more than 10M bit/sec to each desk or are transporting real-time traffic. If you do need more than 10M bit/sec to each desk, then switching to Fast Ethernet probably requires a wiring upgrade, just like ATM, so you need to evaluate each option in light of your current plans.

— Cathy Gadecki and Christine Heckart

ATM

Continued from page 51

ings can be greater. Adding your voice traffic to the ATM backbone using prestandard voice compression and silence suppression techniques can ring up further savings. The target incremental cost for long-distance voice over an ATM backbone should be 1 cent or less per minute.

- **Network equipment** — ATM allows direct connectivity between all edge routers, eliminating the need for expensive, delay-inducing backbone routers. Adding ATM switches to rapidly growing internetwork backbones can save you from further router investments, and you can redeploy existing backbone routers at the edges of your network.

Items to consider on the cost side include:

- **ATM equipment** — ATM does require new network equipment or at least new interface cards on existing equipment. For the reasons noted above, however, ATM can still lower your total equipment tab.
- **Test gear** — ATM test equipment can be expensive.
- **Management systems** — You'll want to consider how you can support the new ATM elements.
- **Operations expense** — You may need additional resources or talent to operate and maintain the new ATM network.
- **Training expense** — This includes the cost of ATM courses and personnel time to take courses and reinforce new skills.
- **Pretesting** — Some companies fund small labs so they can test ATM outside of the production network. If you are building a network to support more than 16 users or are implementing ATM for a critical business function, you may want to make a small investment in such a lab.

TEN ALTERNATIVES TO ATM

In the WAN:

- Private lines and time-division multiplexing
- Frame relay
- Switched Multimegabit Data Service
- SONET
- IP
- IP switching
- Native LAN

In the LAN or campus backbone:

- FDDI and FDDI-II
- Switched Ethernet (or token ring and FDDI)
- Fast Ethernet
- 100VG-AnyLAN

6 Pick strong vendors

Selecting vendors is a critical step in your ATM project. A strong vendor can help you avoid known pitfalls and lend a hand if you get stuck along the way. Choose providers with strong corporate and local customer support. A good account team is a powerful internal voice for your cause if you run into problems — not uncommon in any new networking project.

During your vendor evaluations, ask for recommendations on network configurations, performance optimization and how to achieve interoperability with other network elements and applications. This will provide you with insight into the vendor's experience and network implementation knowledge.

Don't work exclusively with your existing vendor during your network evaluation. Invite a few of its large competitors along with some newer companies. New providers usually employ the latest, lowest cost technology and offer the time, resources, expertise and inclination to help you along. They typically have lots of good ideas for saving money by augmenting your existing network, as opposed to recommending a complete change-out. And they generally don't have mixed agendas to protect their existing product lines while easing into new markets.

For established vendors, new markets represent customer dollars being open again to competitors. Find a company with the right networking solution for your unique situation and the time and willingness to give you individual attention.

7 Assemble a motivated ATM project team

Tackling an ATM project usually means some increased overtime and a few extra headaches for your staff. Therefore, it's essential to enlist team members eager to learn new technologies and build networking skills. A successful project depends on proactive interest and suggestions from everyone on your team, including the ATM users, designers and operations support.

TEN DRIVERS, INFLUENCERS AND SUPPORTERS OF ATM

- Desktop conferencing
- The Internet and the Web
- Asymmetric Digital Subscriber Line
- Cable modems
- Frame relay
- TCP/IP
- Photonic switching
- The last mile
- Private lines
- SONET

8 Allow sufficient implementation time

Although equipment and services are maturing, implementing an ATM network for the first time will probably lead to a few surprises. ATM introduces new networking concepts for even the most seasoned network managers. Start your project before network congestion reaches a fever pitch so everyone has enough time and space to make mistakes and learn. In our consulting practice, we've seen ATM LAN projects start and finish in less than six months. But for large WAN projects, it can take more than 18 months to plan the network, choose vendors, make the final "go" decision and then implement.

TOP REASONS TO CONSIDER ATM

- Relieve congestion on the WAN or campus backbone.
- Eliminate backbone routers.
- Gain strategic advantage or lower business costs.
- Lower network costs by mixing real-time and nonreal-time applications.
- Lower network costs for highly intermittent, high-speed WAN applications.
- Provide high-speed server connectivity.
- Building a new network.
- Gain experience with the technology.

TOP REASONS NOT TO USE ATM

- Another technology meets your current needs.
- Nothing's broken so an ATM fix isn't needed.
- WAN requirements don't exceed 1.5M bit/sec.
- IT resources are scarce.
- Campus network requirements don't exceed 100M bit/sec.

9 Test, test and test some more

Before trusting the ATM network with your production traffic, perform a trial run to give it a good jaunt around the block. Give yourself a couple of months or at least a few weeks to catch any problems that may arise. Include the intended applications in some of the tests. Pretesting helps uncover potential problems and gives you some early experience in managing and operating the network.

10 Learn from others

Although you won't find one on every city block, there are more than 500 ATM networks operating throughout the U.S. The number across the world well exceeds 1,000. More are coming online every day, and each of these implementations is adding to the general pool of industry knowledge.

By talking to other users, you can avoid their mistakes and learn some operational rules. Ask your vendors to put you in touch with existing users who are implementing network configurations and applications similar to yours. Scan industry publications for user stories, equipment evaluations and the latest in standards development. (Editor's note: Part III of the authors' *ATM for Dummies* book includes tales of ATM users' experiences as well as information about comparing ATM with LAN and WAN alternatives, migration strategies, developing an ATM business case, and selecting ATM equipment and service providers.)

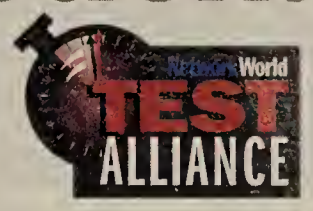
ATM introduces many new capabilities unavailable in existing networks and, therefore, requires a grasp of a whole new range of concepts, options and jargon.

Implementing ATM for the right reasons can introduce these new capabilities to your network and potentially save you money. However, your ATM project will also bring new hurdles and challenges. We hope you find these project tips useful as you consider ATM within your own networks.

Gadecki is senior broadband consultant and Heckart is vice president and director of broadband services at TeleChoice, Inc., a consultancy in Verona, N.J. They assist carriers and equipment vendors worldwide in all aspects of product development, management and marketing in the broadband communications industry. They can be reached at cgadecki@telechoice.com and checkart@telechoice.com.

Getting a jump on tape backup

New tape drive technology can keep your backup hopping.



By Todd Coopee

Tape drives are like kids' sneakers — if you don't wear them out, you outgrow them.

With disk capacity multiplying like rabbits in the springtime, you probably need to investigate how to back up multiple gigabyte-size disk drives efficiently, reliably and cost-effectively. While alternatives such as optical storage subsystems have been available for some time, the lure of high capacity and low cost has helped magnetic tape remain the preferred backup choice.

To get a line on some of the newer high-capacity backup offerings, we scrutinized four proprietary technologies that support 13G bytes or greater of native tape storage: Exabyte Corp.'s Mammoth, Quantum Corp.'s Digital Linear Tape (DLT), Sony Corp.'s SDX and Tandberg Data, Inc.'s Multichannel Linear Recording (MLR). All the tape subsystems we tested use Fast/Wide SCSI-2 to connect to multiple platforms under multiple operating systems, including Unix, Windows NT and NetWare. Most of the drives come in a 5 1/4-inch form factor; the SDX-300C requires only 3 1/2 inches.

Overall, our testing revealed few surprises. Most of the products worked as advertised with few technical glitches. While all of the subsystems offer usable features, Quantum's DLT-7000 was our Blue Ribbon winner based on its outstanding throughput rate and capacity.

However, it faces some stiff competition. Exabyte's Mammoth is a good choice for sites migrating from older 8mm technology, and Tandberg's MLR1 is a solid solution for cost-conscious organizations.

Exabyte's Mammoth

Since their introduction in 1985, 8mm-tape drives have become comfort food for most IS managers. Until the recent introduction of Sony's drives, all 8mm drives were manufactured by Exabyte or one of its licensees, so they have been remarkably consistent.

Exabyte's Mammoth has been shipping in volume since mid-1996. Notable features include 20G bytes of storage and a 3M byte/sec transfer rate.

Like its siblings, the Mammoth drive uses helical-scan recording technology. Two sets of read/write heads sit on a tilted cylindrical drum that spins rapidly. As the drum rotates, the tape moves slowly along the drum. This simultaneous movement of the tape and the head results in each head moving across the tape in a sideways line, or helical pattern. By laying down data in overlapping diagonal strips, more data can be fit on any given inch of tape and capacity is increased.

Helical recording helped Mammoth post respectable results in our performance tests. It performed a full backup of our test data at an average of 258M bytes/min and restored the entire set at a slightly lower average of 221M byte/min (see Figure 1). It also scored near the top in our selective restore tests (see Figure 2, page 56).

In addition to solid performance, Mammoth is backward read-compatible with existing 8mm tapes, except those written in compressed mode by the EXB-8205, an older Exabyte tape unit. Mammoth's media is expensive — a single 170 model number Advanced Metal Evaporated (AME) tape checks in at $99.

Sony's SDX-300C

The Sony SDX-300C is based on a new 8mm recording technology called Advanced Intelligent Tape, which uses higher density recording to pack 25G bytes of data onto a single AME tape, giving it a slight edge in capacity over Mammoth. Its transfer rate of 3M byte/sec is the same as Mammoth's.

Unfortunately, the capacity benefit comes at the expense of backward-compatibility with existing 8mm products. In other words, Sony drives are compatible only with one another.

Another unique feature of the SDX-300C is Sony's Memory In Cassette system, a 16K-byte chip embedded in the data cartridge, which houses the tape's system log and other user-specified information. By placing this information in memory, the SDX-300C can calculate a file location in a backup save set without having to rewind to the beginning of the tape.

The SDX-300C did not back down from our performance tests. Full backups averaged 252M byte/min, while complete restores were slightly slower at 237M byte/min. These values were competitive with Exabyte's Mammoth. The SDX-300C also had excellent selective restore times.

Quantum's DLT-7000

Originally developed by Digital Equipment Corp., DLT technology has existed since the 1980s. Since Quantum took over development in 1994, capacity and throughput have been on the upswing.

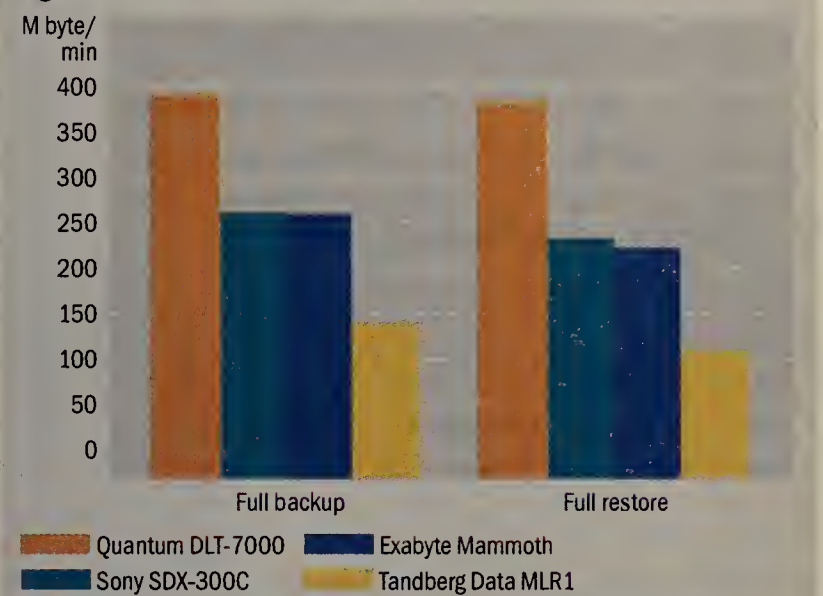
Quantum's most recent offering, the DLT-7000, features a native transfer rate of 5M byte/sec with a native capacity of 35G bytes on a single 1/2-inch tape cartridge. These figures give the DLT-7000 a comfortable lead over the competition.

But high performance comes with a high price tag: At $8,000, the DLT-7000 was the most expensive drive we tested. Like the AME tapes used by the Exabyte and Sony products, DLT tape IV cartridges cost $99.

To achieve its high performance and capacity, the DLT-7000 uses a parallel recording technique called serial serpentine. Serial serpentine drives start writing at the center of the tape, then write lengthwise toward the edges, all the while moving the tape past the head. They keep writing back and forth until they run out of tape.

Quantum enhanced serial serpentine recording in the DLT-7000 via its Symmetric

Figure 1: FULL BACKUP AND RESTORE



ScoreCard

	Quantum (Winner)	Exabyte	Sony	Tandberg Data
Overall score	8.9	8.1	7.1	6.8
Performance and capacity (50%)	10	8	9	4
Backward-compatibility (20%)	10	9	1	10
Cost of drive and media (20%)	5	7	8	9
Installation, documentation and bundled software (10%)	9	9	8	10

Scores are based on a scale of 1 - 10. Percentages are the weight given each category in determining the overall score.

NetResults

Product	DLT-7000	Mammoth	SDX-300C	MLR1
Vendor	Quantum Corp. (800) 625-5545 www.quantum.com/products/dlt	Exabyte Corp. (800) 392-2983 www.exabyte.com/home/mainfocus.html	Sony Corp. (800) 352-7669 www.sony.com	Tandberg Data, Inc. (800) 826-3237 www.tandberg.com/dsmlr.html
Price	$8,000	$5,891	$4,995	$2,749
Pros	▲ Outstanding capacity and throughput ▲ Backward-compatibility with installed base	▲ Backward read-compatibility with installed base ▲ High data rate and capacity	▲ Small form factor ▲ High data rate and capacity	▲ Backward-compatibility with installed base ▲ Low cost for drive and media ▲ Software bundle included
Cons	▼ High cost of subsystem	▼ None significant	▼ Incompatibility with other 8mm cartridges ▼ Proprietary media	▼ Lower performance and capacity than other units

Phase Recording format. With the format, data is recorded on the tape by writing adjacent tracks with an alternating head angle so successive tracks on the tape don't line up with each other. This eliminates cross-track interference, making smaller track widths possible and pumping up capacity.

We were impressed with the DLT-7000's performance. It backed up data at a whopping 390M byte/min. And results of 384M byte/min during full restores were nothing to sneeze at. The DLT-7000 rounded out our testing with selective restore rates that also were at the top in performance.

In addition, the DLT-7000 is fully read/write compatible with all previous DLT tape formats.

Tandberg Data's MLR1

Long known as one of the most affordable backup solutions on the market, 1/4-inch cartridge (QIC) technology has started to make inroads in speed and capacity. The latest offering from Tandberg Data, the MLR1, uses MLR to store 13G bytes of data at 1.5M byte/sec on a single cartridge.

To increase capacity, the MLR1 has 144 data tracks, compared with 42 on previous Tandberg Data drives. The use of servo tracking prevents adjacent tracks from being overwritten at such a high density, and the MLR1's thin-film magneto-resistive head reduces the signal-to-noise ratio.

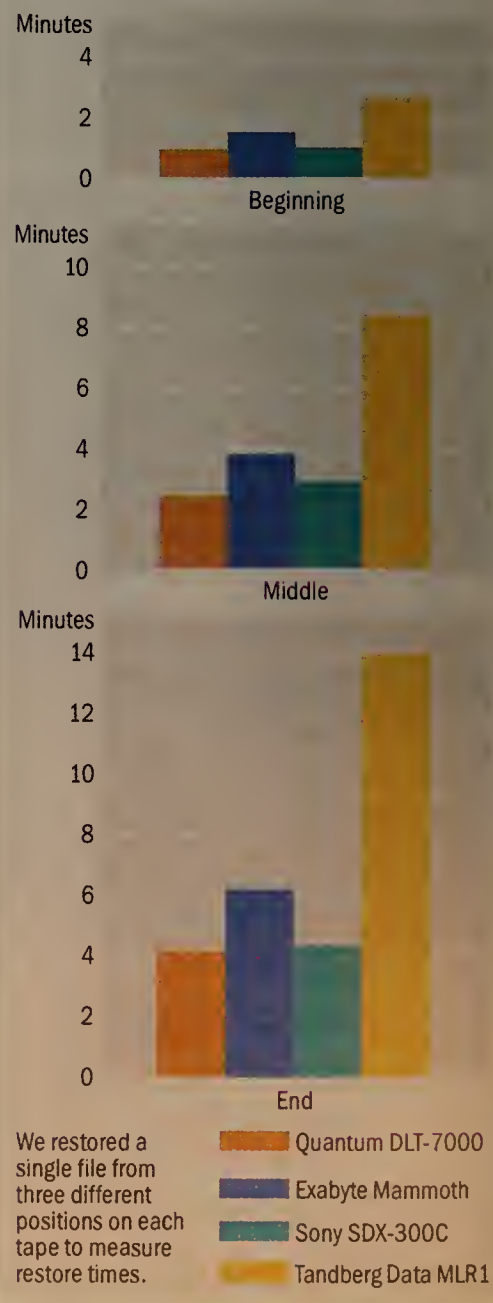
SPEED
A speed of 17M bytes/min equates to 1G byte/hour.

For its price — $2,749 — we were impressed with the performance of the MLR1. While it paled in comparison to the far more expensive DLT-7000, the MLR1 paced itself at a respectable 143M byte/min in our full backup tests. This figure dropped slightly to 102M byte/min during full restores.

The MLR1 had the longest selective restore times of the four units we tested, but you don't have to go to lunch while waiting to get your files back. And media costs are $55 per cartridge, also below the other units we tested.

With the large number of users who have libraries of older QIC media, it's no sur-

Figure 2: SELECTIVE RESTORE RESULTS
Smaller bars indicate better performance



We restored a single file from three different positions on each tape to measure restore times.

When Chiquita needed superior installation and customer service, we were ready for the call.

As the world's largest banana grower saw business ripening in Europe, it chose the telecommunications company that could help reach new markets with speed and efficiency. To open Chiquita's Geneva office, Swiss Telecom streamlined the process to a matter of weeks, providing soup-to-nuts consultation.

"At every level they offered a 'customer first' orientation," said C. Richard Keener, V.P. of Information Systems. If fast, reliable communications links and dedicated customer service sound appealing, call the company Chiquita picked out of the bunch. Call Swiss Telecom North America at 1-800-966-1145.

SWISS TELECOM PTT
Your best connection

Circle Reader Service #**31**

prise that the MLR1 is fully backward-compatible, allowing you to migrate to the new drive with little difficulty.

Tandberg Data also bundles a CD-ROM software suite with each drive, the only vendor in our tests to do so. The CD set contains Seagate Software, Inc.'s Backup suite, including Backup Exec for NetWare, Windows NT, SunOS, Solaris and AIX. Also thrown in are Seagate Backup Exec for DOS, Windows and Windows 95 as well as Seagate's Direct Tape Access for Windows and Windows 95.

Tale of the tape

Each of the four high-capacity storage alternatives offers features that complement a number of user requirements and applications.

For sites with a small backup window, a large amount of data and the bucks to spend, Quantum's DLT-7000 deserves serious consideration. Similarly, for sites heavily invested in 8mm technology, Exabyte's Mammoth may make sense. Like the DLT-7000, it is somewhat pricey but protects your installed library with backward-compatibility. Tandberg Data's MLR1 offers a low price point and adequate performance. Its low media cost and bundled software are an added bonus.

The odd drive out appears to be Sony's SDX-300C. Its low price, capacity and performance are intriguing, but its lack of backward-compatibility concerns us. Nonetheless, it may be appropriate for sites that are taking a first plunge into the high-capacity market.

Coopee is the assistant director of technical services at Trinity College in Hartford, Conn. He can be reached via E-mail at todd.coopee@trincoll.edu.

For complete specs on all these drives, enter the number to the right in the DocFinder box on the home page.

www.nwfusion.com

HOW WE DID IT

We installed each tape drive on a Gateway 2000, Inc. Pentium 120-MHz system with 128M bytes of RAM running Windows NT Server 4.0 (Build 1381). The server was equipped with an Adaptec, Inc. Fast/Wide SCSI-2 card. Throughout our testing, we used Version 6.1 of Seagate Software, Inc.'s Backup Exec for NT Server.

To test each drive's prowess, we created a file system of 2G bytes, a size representative of a large incremental backup or a small full backup. We ran several tests on each drive to determine the relative performance of each tape subsystem.

First, we measured the effective backup rate of each subsystem, which is the amount of time between the start of the backup and the time at which control returns to the operator. This includes the overhead of load, search and data transfer time. We measured full backup and restore times.

Once the backup was completed, we deleted the directory tree, creating a crisis that allowed us to assess each subsystem's performance in restoring data. With the same software we used to back up the original data, we gauged the effective restore rate during a restoration of the entire 2G bytes.

Next, we determined how fast each subsystem could move media past its read/write head to locate a single file (shuttle speed). We performed selective restores on three files: one at the beginning, one at the middle and one at the end of the 2G bytes of backed-up data.

Solutions to your toughest Internet and networking challenges.

3 World-class Conferences

Intensive Full-day Workshops

Powerful, In-depth Tutorials

Conference Sessions

Custom Intranet Application Models

Chair, Michael Howard, *Infonetics Research Inc.*

Tuesday, May 6 • 10:15 am–11:45 am

How can you evolve your intranet from simple publishing to full application development platforms with either Netscape ONE or Microsoft Active Platform? Learn to dramatically reduce the costs of developing, deploying and maintaining applications based on open standards including HTML, JavaScript, VB Script, Java and ActiveX.

Remote Access—Extending tha Network to the Edga

Chair, Val Sribar, *Meta Group Inc.*

Tuesday, May 6 • 4:00 pm–5:30 pm

Need to unify diverse applications and traffic types at remote network locations over a single access facility into the WAN? The intelligent remote access device which supports router-based LAN traffic, Video, POTS or data over ISDN, Frame Relay or ATM is emerging as a cost efficient way to provide integrated carrier services. Examine the issues and possibilities.

Evolution of Broadband Access Technologies and Systems

Chair, Dr. David A. Kettler, *BellSouth Communications*

Wednesday, May 7 • 1:30 pm–6:00 pm—Double Session

Consider challenges associated with various shared-media architectural alternatives for delivering advanced broadband multimedia services to residential and business subscribers. Wade through the maze of residential broadband access options with this panel of world-class experts representing independent research/academic institutions, MSD/LEC equipment vendors and service providers.

Competitive Access Providers—The MAN Alternativa

Chair, Gerald Ryan, *Connections Telecommunications Inc.*

Thursday, May 8 • 10:15 am–11:45 am

CAPs are positioning themselves to offer cost effective services well beyond the provisioning of bypass access to interexchange carriers. Discover CAPs' key advantages. Examine the technical issues, the pros and cons of their services, cost tradeoffs and implementation concerns.

1–Day Workshops

Internet and Intranat Security Design and Management

Marcus Ranum, *V-ONE Corporation*

Wednesday, May 7 • 9:00 am–5:00 pm

Don't unwittingly accept substantial security risks! Firewalls help, but must be combined with good site security practices. Get a technical overview of security design and maintenance techniques to protect your business in the highly networked future. Discuss risk assessment, security policies and procedures, security solution design and selection, auditing and incident response.

IPv6 Transition Planning

Robert E. Gilligan, *FreeGate Corporation*

Thursday, May 8 • 9:00 am–5:00 pm

Faced with integrating IPv6 products into your existing IP network? Explore the special mechanisms that have been designed into IPv6 to simplify transition and look at the various transition alternatives available to small and large Internet and intranet sites. Specific transition plans will be shared that can be customized to individual requirements.

2–Day Tutorials

Everything You Need to Know About Internet Protocols to Enhance Network Performance

Dr. David Clark, *MIT*

Monday–Tuesday, May 5–6 • 9:00 am–5:00 pm

Look specifically at Internet protocols such as TCP to get a clear, simple introduction to core network performance issues and an in-depth look at critical topics including congestion control, performance tuning and diagnosis, specification of performance and very large network issues. Enjoy a non-mathematical approach relevant to your real-world problems.

Hot Topics in Networking: ATM, High-spaed LANs, Multimedia, Wireless, IPng and ABB

Dr. Raj Jain, *Ohio State University*

Monday–Tuesday, May 5–6 • 9:00 am–5:00 pm

Discuss trends and consider hotly debated new developments and technical issues such as multimedia, wireless LANs and WANs, IPng, and residential broadband. This tutorial is designed as a technical overview of recent advances in networking for attendees who do not have time to take individual tutorials on each topic.

ATM and IP: Thaory and Practica

Dr. Douglas E. Comer, *Purdue University*
Dr. Paul V. Mockapetris, *Software.Com*

Thursday–Friday, May 8–9 • 9:00 am–5:00 pm

Survey the two most promising networking technologies for the next decade, learn their strengths and weaknesses, and explore ways IP and ATM can be integrated. The course examines the likely future as IP evolves to version 6, as more of the ATM promise is realized, and as alternatives such as Fast Ethernet and direct access to SDNET evolve.

Internet Multicast and Multimedia Technologies: The MBone, RTP and RSVP

Dr. Steve Deering, *Cisco Systems*
Dr. Deborah Estrin, *USC*
Dr. Lixia Zhang, *UCLA*

Thursday–Friday, May 8–9 • 9:00 am–5:00 pm

Discuss the creation, operation and application of the MBone and the underlying protocol technologies which have further evolved due to the MBone's rapid growth. Examine the future of Internet architecture and protocols including the forthcoming resource reservation protocol, RSVP, the proposed multicast routing protocol, PIM, and a new, highly scalable protocol for reliable multicast, SRM.

NetWorld℠+Interop® offers these in-depth educational programs ond mony more! Coll or visit our Web site todoy for more information.

The best minds in the industry.

For more than a decade, NetWorld+Interop has delivered the very best technical instruction in the world. Our instructors and panelists are among the most highly regarded experts in their fields. These are the people who write the books, so you get answers directly from the source. NetWorld+Interop Las Vegas is the only place to be this May.

Conference Programs: May 5–9, 1997

Exhibition: May 6–8, 1997

Las Vegas Convention Center

For program details visit www.interop.com.

Register online or call 1-800-944-4629 or 1-415-372-7090.

NETWORLD+INTEROP 97
Where the enterprise meets the Internet.

BOI7WSPB

Management Strategies

Covering: Career Insights and Innovations in Managing Staff, Budgets and Technology

Briefs

■ **American Research Group, Inc. (ARG)** *next month will offer two- and three-day trainings on IBM router, switch, LAN management and remote access products at its facility in Raleigh/Durham, N.C.*

The courses are part of **IBM's NETeam Education** *program and are required for the IBM Certified Specialist and Certified Networking Solutions Engineer, Levels 1 to 3. For IBM partners, two-day courses cost $956 and three-day courses cost $1,116. Two-day courses for end users cost $1,195, and three-day courses cost $1,395. Group discounts are available.*

© ARG: (919) 461-8600.

■ **AG Group, Inc.** *has jumped into advanced networking and connectivity training via its new* **Network Management Training/Consulting Services** *division.*

The division provides courses for network support professionals on-site and at locations throughout North America on protocol analysis, network design and troubleshooting. Consulting services for network evaluation and troubleshooting also are available.

Eventually, the company will offer advanced network management courses leading to Certified Network Expert certification, a multiprotocol, multivendor benchmark for measuring troubleshooting skills.

© AG Group: (510) 937-7900.

■ **Learning Tree International** *this spring will begin training* **General Motors Corp.** *retailers on GM Access, a client/server system that GM says will improve its internal business practices and customer service.*

GM Access includes collaborative software that enables dealers to locate vehicles for customers and access warranty information. In addition, Learning Tree will train dealer personnel on computer basics, Windows 95 and Windows NT.

& Learning Tree: (800) 843-8733.

ICA goes on the prowl for new members

Rebounding from four money-losing years, the once-mighty ICA seeks new blood.

By Douglas Welch

Once considered an exclusive club for telecommunications high rollers, the International Communications Association (ICA) is now aiming to appeal to a broader audience and regain the luster it lost during the past few years.

The nonprofit group took a step in the right direction last year when its finances returned to the black after four years of running in the red, which forced the ICA to dip into cash reserves to cover operating costs.

"We have made a major turnaround," says Woody Randall, ICA chairman. "[And now] we are launching a membership drive to pick it up some more."

The group has modified some of its bylaws and is stressing its educational programs as a membership benefit that complements its telecommunications lobbying efforts.

Perhaps the most noteworthy and symbolic gesture is the removal of a long-standing bylaw that makes membership open only to corporations that spend at least $1 million a year on telecommunications services. Even though more companies are reaching that threshold today, the bylaw was viewed as an impediment to luring new members, if for no other reason than the group was perceived as being for big spenders only.

Founded in 1948, the ICA has always gone after the biggest companies. Back then, when the state-of-the-art network technology was plain old telephone service delivered through the Bell System, large companies wanted to band together to gain power in dealing with Ma Bell and influence government regulations.

The coupling of deregulation and the growing importance of data communications in the late 1980s caused a number of companies in the ICA to question the value of membership, especially as the group remained focused on telecommunications issues.

"A lot of members dropped out because they thought the benefits had diminished," Randall says. "There was a feeling that ICA was a 'good old boy' organization. We've tried to dispel that in the last couple of years."

Even now, Randall says he still hears comments that the ICA touts the benefits of its lobbying efforts too heavily. "Some of our older members are saying 'I get that benefit whether I'm a member or not.' " While Randall acknowledges that is true, he says it's still membership dues and other income that provides the money to fuel the effort.

Business factors also took their toll on membership. When ICA companies merged, two members suddenly became one. That happened quite a bit, Randall says. Also, when ICA firms faced budget-cutting pressures, annual dues became a cutable expense.

The ICA *has introduced a new Web site as it prepares for its 50th anniversary and embarks on plans to spread the word about membership benefits.*

The dues are now $975 per company, up from $400 to $500 in the late 1980s. Dues kept going up as membership went down. The ICA now has 400 member companies, a drop from 750 companies when the group hit its membership peak in the mid-1980s. Because each corporation can appoint five members, the total membership is near 2,500 now, as opposed to 3,500 then.

As membership dropped, so did attendance at the annual ICA conference and exhibition. Consequently, vendors stopped signing up to exhibit at the show, causing a drain on cash reserves.

To curtail costs, the ICA signed a five-year agreement in 1995 to merge its conference with the Supercomm show, which caters to telephone companies.

Under the agreement, the ICA sells space on the Supercomm show floor to vendors that target end users and runs a series of educational conferences, seminars and tutorials. At this year's Supercomm in New Orleans (June 1 – 5), the ICA will have 40 to 50 educational offerings, including two-day tutorials, one-day miniconferences and one-hour break-out sessions covering everything from Internet and intranet technologies to career management.

The ICA also lost members when it was too slow to shift its educational focus from managing telephone systems to data networks 10 years ago. However, Randall says 80% of the group's educational programs now address data communications."Had we stayed focused just on voice, as we were in the past, we would have been gone a long time ago," he says. "It's hard to draw a line between voice and data today. We all have to be knowledgeable across the board.

One of the biggest successes in data network training was the introduction six years ago of the ICA Summer Program at the University of Colorado at Boulder. It is a weeklong technical workshop with laboratories and hands-on sessions designed for nonmanagement staff, covering issues such as building large router-based networks.

"It's more of a worker-bee educational program than a management one," Randall says. "We have labs with working equipment furnished by several vendors, and we have instructions in those labs. It is actually a touchy-feely type of thing. The classroom sessions are very high-tech and focused on the how-to side of things as opposed to theory. Last year's summer programs were on LAN/WANs, how to install, run and manage them."

The ICA has a new Web site where members can engage in discussions, read news related to ICA issues and explore links to other relevant sites. Access to more detailed material, including a job bank, is available to members via a password-protected system.

To some members, the value of belonging to the ICA is a personal thing. "Probably the biggest selling point of ICA has been networking with my counterparts," says Ruth Michalecki, director of telecommunications at the University of Nebraska at Lincoln.

The problem today is that fewer people outside the telecommunications industry know much about the ICA.

"It is amazing that when I go around the country and attend other shows and introduce myself to vendors and users, they don't even know what the ICA is," Randall says. "They have never heard of it. That just blows me away when that happens. We've been in existence for 50 years and people don't know about us now."

The membership drive and other measures are key elements in the ICA's plans to enhance its services in preparation for the group's 50th anniversary next year.

Welch is a computer consultant and freelance writer in Van Nuys, Calif. He can be reached at dewelch@earthlink.net.

Manager Network Operations

Direct the operations and support of a mission critical 24x7 financial services network. Network serves 15 locations/6000 devices, using Cisco 7500 router platform. Total staff of 20 responsible for NCC, network management systems, and all network reconfigurations. Network in excellent condition, opening exists due to promotion.
Pennsylvania $80-100K

Manager Call Center Technologies

Provide centralized resources for call center technology support to Fortune 50 with 25 call centers ranging in size from 25-350 agents. Direct technology (ACD/VRU/CTI, etc.) evaluations and implementation. Educate I/T and business operations management on networking and telecommunications technologies, and collaborate on high impact projects. Excellent opportunity to contribute and grow.
Michigan $70-90K

Manager, Internet Operations

Direct staff of technical professionals (approx. 12) responsible for 24x7 support of web infrastructure and related services. Provide "world class" internet operations support for presentation of commercial products and services of leading financial services organization. Internet operations will support both implementation and operation of infrastructure (ISP, Firewalls, DMZ, Sunboxes, Solaris OS, Netscape OM, database interfaces, gateways, network management), and also provide monitor and repair services on a 24x7 basis. Newly created position in high growth company. Excellent compensation, benefits and relocation assistance.
Pennsylvania $80-100K

Communications Systems Architect

Investigate, evaluate, test, and recommend a wide array of transport services, and communications hardware/software to develop strategies and plan integration of new technologies into existing architectures. Engineer infrastructure, develop and present proposals concerning deployment. Desirable technical expertise includes networks (voice/data), CTI, telecommuting, fiber/SONET, intra/internet, and frame relay/ATM. Excellent opportunity to work with leading edge technologies and related business applications in an end-user setting.
Florida $70-90K

Other Opportunities

Currently conducting additional searches for data network engineers, call center technology professionals (technical and managerial), and call center operations manager. Contact for details.

Frank Schoff
MRI Cedar Mountain
P.O. Box 629
Cedar Mountain, North Carolina 28718
Tel: 704-884-4118 Fax: 704-884-3512

Networking and Telecommunications Recruiting Specialists

Research Analyst

National brokerage firm is seeking a research analyst to follow the data networking industry. Requirements include an undergraduate degree in engineering, an M.B.A. degree, and sales/marketing experience in the industry. We would prefer to interview candidates currently employed in the New York metropolitan area. Please fax your resume to Linda Gausney at (212) 449-4665.

Software Engineer: Perform analysis, design development, and testing of complex relational database systems on Windows 95 using MS Visual C++ and MFC and MS/Access. Position requires an M.S. in Computer Engineering and four years prior experience as a Software Engineer, including experience using MS Visual C++ and MFC and MS/Access. 40 hrs/wk; 8am-5pm; salary of $45,000/yr. Send resume with Social Security No. to Indiana Dept. of Workforce Development, 10 N. Senate Ave., Indianapolis, IN 46204-2277, Attn: Sean M. Blancaneaux. Include ID#3450424 with response. Applicants must be eligible for permanent employment in the United States.

be Ready for GROWTH

SunTrust Service Corporation, a subsidiary of SunTrust Banks, Inc., has an opportunity available in Atlanta, GA, for a Sr. Telecommunications Analyst.

Sr. Telecommunications Analyst

Requirements include a Bachelor's degree in a technical or engineering field and extensive hands-on experience in planning, designing, and implementing complex LAN/WAN/WAN DATA networks. Must have a thorough knowledge of CISCO Routers, Frame Relay (MCI), routing SNA over Frame Relay, IP addressing, and routing TCP/IP and IPX protocols. Also requires a good knowledge of designing multi-story collapsed backbones using mixed media (fiber and copper), 3 COM Hubs, sniffer equipment, and the following applications: NETVIEW 6000, CISCO WORKS, TRANSCEND, and HYPERSCOPE (MCI Frame Relay).

We offer ongoing challenges, outstanding benefits and compensation, and career advancement. Please send or fax resume, which must include salary requirements for consideration, to: SunTrust Service Corporation, Dept. 9019/AM-NET, (Sr. Telecommunications Analyst), P.O. Box 4418, Atlanta, GA 30302-4418; FAX: (404) 230-1823. We will only contact candidates under consideration.

SUNTRUST
Be Ready For Life™

A Drug Screen and Equal Opportunity Employer, M/F/D/V

Network World NETWORLD+INTEROP CAREER FAIR LAS VEGAS, MAY 6-8

Your telecommunications connection to the future.

As a rapidly expanding industry leader, Cox Communications is gearing up to offer our "one-stop shopping" cable programming, high speed Internet, wireline and wireless telephone services. We are seeking talented and motivated team players to contribute and enjoy the success of our new services as we introduce them to the **PHOENIX** area.

Data Network Engineer & Operations Manager

You will have the unique opportunity to design and develop, implement and then operate all facets of our Network. Requires:
- 5-10 years network engineer experience; BSEE/CS or equivalent
- Advanced knowledge of network operating systems/networking protocols (TCP/IP, Windows NT, Novell)
- Familiarity with UNIX platforms (DEC & HP) as well as routers/bridges, LAN, WAN, MAN
- Experience with data transmission technology (FDDI, SONET) a plus; Control Center Management background desired

System Administrator

In this role, you are able to support various flavors of UNIX on several different platforms. Requires:
- Ability to support NFS, sendmail configuration support, DNS, DHCP, Bootp/TFTP, backup scheduling, and shell programming
- Responsibility for establishing/maintaining security procedures on all UNIX platforms
- Familiarity with Oracle and networking a plus; background with NT desired
- WebMaster skills a plus

At Cox Communications, a generous benefits package is offered, along with a fully-paid pension plan. As an employer that is bringing new services into a new market, the opportunities and new technologies available to you are numerous. See us at www.cox.com. Send resumes, with salary requirements to: **Cox Communications, Attn.: HR-BBS-1, 176012 N. Black Canyon Hwy., Phoenix, AZ 85023. FAX: (602) 993-7142; e-mail: hr@phx.cox.com.** We encourage workforce diversity.

COX COMMUNICATIONS

TAKE THE XDSL FASTRACK

We're rolling out xDSL. We're moving fast and we're looking for product managers and engineers to help us move even faster. We're !NTERPRISE Networking Services from U S WEST, a national data network integrator. Speed is a way of life around here. We launched ahead of the pack with an aggressive deployment of Frame Relay in 1992 and with !NTERACT Internet Services in 1995. Now we're accelerating with xDSL internetworking solutions.

Check us out with at the Web addresses below and send us your resumé by email to fjglynn@uswest.com, or by fax at 303.965.9281. We'll make sure the people we hire get all the speed they need with xDSL connections at home.

XDSL Solutions http://uswest.com/atwork/interprise/dsl_index.html
Job Openings http://uswest.com/aboutusw/communications/index.html

!NTERPRISE
NETWORKING SERVICES FROM US WEST

Marketplace

The Hub of the Network Buy

Free Product Information

To receive more information circle the reader service numbers of products that interest you.

Send this coupon to: Network World P.O. Box 5090, Pittsfield, MA 01203 or Fax (413) 637-4343, or use the prepaid card elsewhere in the issue.

Expires 6/30/97

Name: _____

Title: _____

Company: _____

Phone: ( ) _____

Street: _____

City: _____

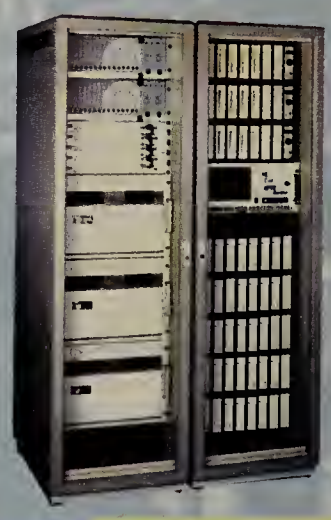
State: _____ Zip: _____

217	218	219	220	221	222	223
224	225	226	227	228	229	230
231	232	233	234	235	236	237
238	239	240	241	242	243	244
245	246	247	248	249	250	251
252	253	254	255	256	257	258
259	260	261	262	263	264	265
266	267	268	269	270	271	272
273	274	275	276	277	278	279
280	281	282	283	284	285	286
287	288	289	290	291	292	293
294	295	296	297	298	299	300
301	302	303	304	305	306	307
308	309	310	311	312	313	314

3/24/97

Let's Talk TurnKey!

Total Online Systems Solutions



- Plug & Play Mass Storage Networking
- Compatible with ALL Major Operating Systems
- Latest and Fastest CD-ROM Drives
- Customizable Drive Arrays
- Remote Access Systems
- Internet/Intranet Servers
- CD Writers/Duplicators/Media
- Direct Partners with Major Manufacturers
- Available under GSA Contract
- Toll-Free Technical Support

OPTI-NET® *Direct HL-7*

- Completely installed and ready for use
- Fully equipped 7-Drive CD-ROM Tower
- Compatible with NetWare, Windows (NT and 95), UNIX, and OS/2
- Works on existing Ethernet network
- No NLMs and no TSRs
- Protocol independent

SPECIAL
Only $995!
(Standalone Tower $695)

TODD ENTERPRISES INC
800-445-TODD (8633) • 516-777-8633
FAX: 516-777-2750 • http://www.toddent.com

Reader Service No. 266

SNMPc

Network Manager for Windows

Only $795

NETWORK COMPUTING EDITOR'S CHOICE

- Full RMON Support
- Integrates with HP OpenView
- TCP/IP, Telnet, TFTP, BOOTP
- WinSNMP/WinSock/DDE APIs
- SNMP, ICMP, IPX Polling
- Node Discovery
- Long Term Statistics/Thresholds
- Custom Event Actions/Forwarding
- Over 100 Device Specific GUIs
- MIB Compiler/Browser

Castle Rock Computing

408-366-6540
Fax: 408-252-2379

Reader Service No. 252

SOLUNET

Nothing But NETworks

Partners for Integrated Solutions

Shiva · 3Com · ChatCom, Inc. · Attachmate · ADC Kentrox · ADTRAN · Compatible Systems · Bay Networks · ASCEND · microcom · US Robotics · Digital Link · Livingston Enterprises, Inc. · TELEBIT · CISCO SYSTEMS · SecurityDynamics

A communications systems integrator specializing in remote access connectivity solutions.

Best Price — Best Service.

We offer a select portfolio of products, a factory trained support staff and a host of hardware, installation, maintenance support packages and services to keep all internetworking products on-line and operating at peak performance.

...Available on GSA Schedule

Contact our specialists at...
Phone: (888) SOLUNET (765-8638)
Fax: (407) 676-0809
E-Mail: SALES@SOLUNET.COM
WWW.SOLUNET.COM

Reader Service No. 298

PRODUCT REVIEW

■ Wouldn't it be nice to have one product for all your remote control requirements? With NetSupport for Windows and OS/2, you can reach any Windows 3.1X, Windows 95, Windows NT, OS/2 or DOS PC from the comfort of your own desktop. View the remote screen, control it's keyboard and mouse, transfer files back and forth. All done across your LAN or WAN (NetBIOS, IPX, TCP/IP) or via dial up (modem, ISDN).

NetSupport for Windows and OS/2 offers the Speed to remote control your workstations, regardless of screen resolution. It interacts with the operating system using as few resources as possible. Optional compression levels assure good performance even across slower WAN or dial up links.

NetSupport for Windows and OS/2 provides the ease of use needed in a remote control product. Easy to install, easy to configure and very easy to use. Browse feature scans the network and presents a list of available PC's. One click, and you are connected. Establish remote control sessions, chat sessions, file transfer sessions, all simultaneously and across platforms. With NetSupport, you will feel right at home.

NetSupport is available exclusively through Markham Computer Corporation.

For your evaluation copy with no obligation please call 1-800-2MARKHAM (7542)

PC REMOTE CONTROL SOFTWARE

Windows NT, Windows 95, Windows 3.x, DOS, OS/2

NetSupport Manager

Features include:

- Watch, Share or Control any other PC's
- Lan, Dialup and Gateway all-in-one
- Show Control Screen to one or many Clients
- Advanced Modem Diagnostics for trouble free installation
- Sophisticated "Drag and Drop" File Transfer
- Chat On-Line to users
- Send messages to one or many PC's
- Control any platform simultaneously
- Supports higher and lower resolutions on client PC's simultaneously

DATA COMPRESSION & ENCRYPTION

HOW TO RACE PAST THE HIGH COST OF T1

Compression Communications Corp.

Features include:

- Protocol transparent with increased throughput up to 5x
- Includes error correction providing digital quality from analog lines
- Supports frame relay with SNMP management and WAN input speeds to TI/EI
- 256 byte encryption algorithm for network and data security

DATA SECURITY PRODUCTS

BECAUSE ATTACK IS THE BEST FORM OF DEFENSE

NORMAN
Norman Data Defense Systems

Features include:

- Complete Virus protection package
- Secure access control
- Tenc transparent data encryption
- Virus control package approved for use by the US Military
- Leading Macro Virus solution
- Reduces down time through desktop stabilization

MARKHAM COMPUTER CORPORATION

- **Remote Control**
- **Security**
- **Compression**
- **Network Management**

America's Network Optimization Company

Tel: 561-394-3994, ***1-800-2MARKHAM (262-7542)***, Fax: 561-394-3844
E-Mail: info@mcc-usa.com, Web: www.mcc-usa.com

Reader Service No. 228

WinSNMP

NetPlus® WinSNMP Developer Kit

The *NetPlus* WinSNMP Developer Kit is for you!

The lowest priced, "quick-start" in SNMP application development centers on the high-performance, low-overhead NetPlus WinSNMP/Manager DLL and includes complete MSVC++ project files (with source code) for a set of basic, SNMP utility applications. The Developer Kit gets you moving quickly and in the right direction on your SNMP application development projects.

New Low Price
$199.00

- ✦ Shorten your SNMP development learning curve
- ✦ Reduce your application development time
- ✦ Speed your product time-to-market
- ✦ Broaden your market potential
- ✦ 16 and 32-bit versions included

Includes the best WinSNMP DLL on the market!

ACE*COMM

phone: (301) 721-3000 fax: (301) 258-5692
Info@acecomm.com http://www.acecomm.com

Reader Service No. 223

Easy SNMP

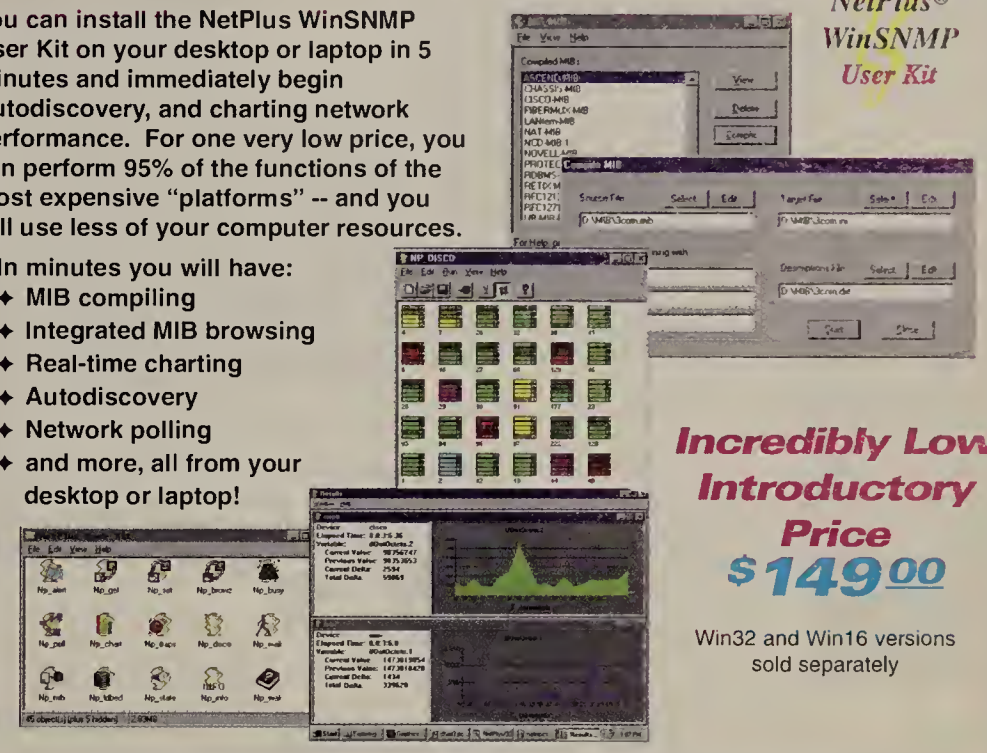
NetPlus WinSNMP User Kit

NetPlus® WinSNMP User Kit

You can install the NetPlus WinSNMP User Kit on your desktop or laptop in 5 minutes and immediately begin Autodiscovery, and charting network performance. For one very low price, you can perform 95% of the functions of the most expensive "platforms" -- and you will use less of your computer resources.

In minutes you will have:

- ✦ MIB compiling
- ✦ Integrated MIB browsing
- ✦ Real-time charting
- ✦ Autodiscovery
- ✦ Network polling
- ✦ and more, all from your desktop or laptop!



Incredibly Low Introductory Price
$149.00

Win32 and Win16 versions sold separately

Installed and operating in just 5 minutes!

ACE*COMM

phone: (301) 721-3000 fax: (301) 258-5692
Info@acecomm.com http://www.acecomm.com

Reader Service No. 254

UpTime Ltd

Your resource for storage, backup, network, and communication products!

STORAGE	BACKUP
RAID Systems	4mm/8mm/DLT
SCSI Drives/Arrays	Drives
CD Drives/Arrays	Libraries
Network Attached	Software

NETWORK	COMM
Switches	Remote Access
Routers	Modem Pool
Repeaters	CSU/DSU
Print Servers	Terminal Server

405-330-3033 405-330-3478 FAX
sales@uptime.net 405-330-6120 FOD

Reader Service No. 236

UNIX SNMP

YES, IT DOES UNIX

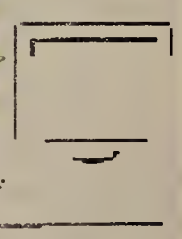
NetPlus® WinSNMP for UNIX Developer Kit

The *NetPlus* WinSNMP Developer Kit is for you!

The NetPlus WinSNMP/UNIX SDK offers you the quickest and easiest start to your SNMP software development projects for UNIX platforms. All components of the SDK comply with the industry-standard WinSNMP API specification (v2). This SDK includes our "best of breed" WinSNMP implementation (adapted from Win32 as a UNIX shared executable library), and associated dependent, make, and documentation files, in addition to several helpful utility applications and a full set of sample source code with complete C language project files. The NetPlus WinSNMP/UNIX implementation interfaces with the network over the standard UNIX sockets library through a virtual, WinSock-like API for UNIX. This non-blocking, asynchronous interface provides network stack transparency and high performance operation for your applications.

- ✦ Shorten your SNMP development learning curve
- ✦ Reduce your application development time
- ✦ Speed your product time-to-market
- ✦ Broaden your market potential

Promotional Pricing $499.00 through 4/30/97



Includes the best UNIX WinSNMP Library on the market!

UDL customers call for special discounts.

ACE*COMM

phone: (301) 721-3000 fax: (301) 258-5692
Info@acecomm.com http://www.acecomm.com

Reader Service No. 260

WANTED!

RESELLERS & ISPs

Call NOW! (888)575-ISDN

Come see us at
- Internet World - Los Angeles Mar 12-14 (booth# 4983)
- Netcom Network - Ft. Lauderdale Mar 26-27 (booth# 1410)

ARESCOM APEX™ ISDN ROUTER

- Automatic ISDN SPID, switch type & line speed detection
- Bandwidth/Dial-on-demand
- Dialup remote configuration
- Analog phone/fax ports
- Secure networking
- IP routing
- 128 Kbps
- Windows® 95 GUI support

APEX 1100

Call for details on internal & external ISDN terminal adapters.

ARESCOM designs, manufactures, and markets a wide range of quality Internet equipment to meet your needs. We also have **attractive reseller and ISP programs**, for more information please contact us at (888)575-ISDN.

ARESCOM

Email: sales@arescom.com
URL: www.arescom.com

Reader Service No. 284

Don't stay LAN-locked...

Break out with Internet E-mail.

Forget inter-office boundaries. Whether you use **Lotus cc:Mail or Notes, Novell GroupWise, Microsoft Mail or Exchange**... in just minutes, your entire organization can be "connected" with TOLL-FREE, reliable, secure, virus scanned Internet mail capabilities. We'll help set up and configure your system—even register an Internet domain name. Don't be a victim of LAN-lock... Internet mail can be yours easily and affordably. Call us today to set up a free trial account.

1-800-209-6245

6450 Poe Avenue, Suite 416
Dayton, Ohio 45414
info@allegro.net • http://www.allegro.net

Allegro NET™ *The Corporate E-mail Authority*

Lotus cc:Mail & Notes, Novell GroupWise, Microsoft Mail & Exchange are trademarks of their respective companies.

Reader Service No. 303

SOME OF THE PRODUCTS *NETWORK WORLD* READERS PURCHASE

Local Area Networks	Baluns	Internetworking Hubs	ATM (LANs)
Microcomputer/PCs	Routers	T-1	Data Switches
LAN Servers	Gateways	Intelligent Hubs	Mainframes
Printers	Security Software	Fiber Optics	ISDN
Modems	Graphics Software	Groupware	ATM (WANs)
Laptops	LAN Hubs	DSU/CSUs	T-3
Bridges	Bridge/Router	Wireless LANs	Frame Relay
Cables, Connectors,			

CALL ENKU GUBAIE AT 1-800-622-1108 EXT. 465

SAVE 50% & MORE ON MOST PRODUCTS
BUY/SELL/NEW/USED
VISA RENT MasterCard
Reconditioned With Warranty
Multiplexers • T-1/E-1
CSU/DSU's • Channel Banks

CSU/DSU, ALL RATE, V.35/RS232	$99
Newbridge Channel Banks	$2800
Micom Marathon 1K,5K,5K Turbo,10K	50% off
Routers (NEW!)	$895
Kentrox T-Serv II	$450
T-1 CSU's	$250
Telco Systems Channel Banks	$2800
Newbridge 3600 Modules	CALL
T-1 CSU w/Drop/Insert NEW	$995
Stat Muxes 4, 8, 16, 32, port	LOW
T-1 CSU/DSU V.35	$495
Fraction/Full T-1 CSU/DSU	$595
Channel Bank Rentals	$199/mo

METROCOM
THE SUPPLIERS' SUPPLIER
(800) 364-8838 or (281) 495-6500
FAX (281) 495-8449 24 HRS
HTTP://www.MetrocomInc.Com

Circle Reader Service No. 220

For More Information About Marketplace
1-800-622-1108

NEW! NEW! NEW!
Fiberdyne Labs, Inc.

State of the Art
10 BASE T Ethernet
RJ45-Fiber Converter
Model FTX-R11 w/ST's
and Model FTX-R61 w/SC's

Made in U.S.A.

Qty	Unit Price	
1-5	$190.00	FACTORY DIRECT SAVINGS
6-20	$183.00	
21+ Call (800) 894-9694		

FIBERDYNE LABS, INC.
818 Park Lane Dr., Herkimer, NY 13350
www.fiberdyne.com

Circle Reader Service No. 291

Shared Hubs Too Slow?

INCREDIBLE DEAL
$895
24 port Ethernet Switch
At The Price of A 10BT Hub
(Less Thon $40 Per Port)

SMC TigerSwitch XE-24 10BT Ethernet Switch
(Factory Refurb-Limited Quantities)

- 24 RJ-45 Switched 10BT Ports
- VLAN Support
- Dual Risc Processor
- 110-220 VAC (Self-Ranging)
- 178,560 Frames/sec
- Built-in SNMP Management
- User Programmable Filtering
- Plug and Play-Easy Install
- 30 Day Exchange Warranty

NETFAST
www.digitalwarehouse.com
DIGITAL WAREHOUSE
Your Information Superhighway Discount Source
VISA 800-439-8558 MasterCard

Circle Reader Service No. 251

NOVELL - INTRA NW/v4.11 - OEM		MICROSOFT NT - v4.0	
v4.11 - 5 User	$525	NT Server - 5 Clients	$445
v4.11 - 10 User	$1045	NT Server - 10 Clients	$585
v4.11 - 25 User	$1875	NT Server - 01 License	$45
v4.11 - 50 User	$2525	NT Server - 20 License	$280
v4.11 - 100 User	$3685	NT Workstation-Single	$175
v4.11 - 250 User	$6685	NT Workstation-Licenses	$95
		OfficePro & Bookshelf	$175
NOVELL - INTRA NW/v4.11 - RETAIL		**NOVELL UPGRADES TO v4.11**	
v4.11 - 5 User	$610	5 User - $340	10 User - $585
v4.11 - 10 User	$1250	25 User - $785	50 User - $995
v4.11 - 25 User	$2095	**NETWARE FOR SAA V2.0 SESSIONS**	
v4.11 - 50 User	$2995	16 - $995	64 - $2395
v4.11 - 100 User	$4350	128 - $3195	254 - $4325
v4.11 - 250 User	$7050		

UPGRADES UP TO 60% OFF LIST
WE CARRY ALL 3 COM - INTEL - CISCO PRODUCTS, PLEASE CALL!!!
Bring us your Best Deal in town and we will beat it, ANYTIME!!
SAFE SYSTEMS
Tel: 800-399-2808
Fax: 818-904-1860

Circle Reader Service No. 296

NETWORK HARDWARE
ROUTERS • DSU/CSU • HUBS
TERMINAL SERVERS • SWITCHES
BUY/SELL/LEASE
CISCO
LIVINGSTON • ADTRAN • ADC/KENTROX
BAY NETWORKS • 3COM • CISCO
800-230-6638
VISA Fax: 805-964-5649 MasterCard
http://www.networkhardware.com
NETWORK HARDWARE RESALE, INC.
1800 THE STRAND • HERMOSA BEACH, CA 90254

Circle Reader Service No. 244

USED CISCO DIRECT

NETFAST
Save up to 80% on new/used:
➤ Routers ➤ Switches ➤ T1 CSU/DSUs ➤ Hubs
➤ ISDN/ATM ➤ Frame Relay ➤ Modems

CISCO SYSTEMS
WE BUY USED

➤ CISCO ➤ Boy Networks ➤ 3COM ➤ Ascend ➤ Livingston ➤ IBM
➤ ADC Kendrox ➤ Adtron ➤ USRobotics ➤ Shivo ➤ HP
➤ Newbridge ➤ Cobletron ➤ Sun
➤ Motorolo ➤ Modge ➤ Intel

www.digitalwarehouse.com
DIGITAL WAREHOUSE
Your Information Superhighway Discount Source

VISA **800-439-8558** MasterCard
210-20 23rd Ave. Suite #2, Bayside, NY 11360 Phone: 718-428-3139 Fax: 718-281-1186

Circle Reader Service No. 259

INTERNET SERVICE PROVIDERS & WEB HOSTS

New York Net
(800) 806-NETS NY/NJ/CT/PA/MA
sales@new-york.net
SLIP, PPP, Leased Lines, T1s,
Frame Relay, 10Mbps, DS

For information on listing your service here, contact Enku Gubaie at 800-622-1108 x1465, egubaie@nww.com

---

REFURBISHED

Bay Networks

SynOptics WELLFLEET communications

Largest Inventory of Refurbished Bay Networks in America!

- Bay Networks Trained
- Bay Networks Authorized
- Hundreds of pieces in stock
- New and Used Equipment
- Proven Track Record
- One Year Warranties
- Design and Install Services
- Technical Support

CABLETRON SYSTEMS The Complete Networking Solution™ · 3Com · IBM · MADGE · NOVELL

On-Sight Router Installation

WE REPAIR ALL BAY NETWORKS!

National LAN Exchange 800-243-5267

1403 W. 820 N. Provo, UT 84601 FAX 801-377-0078 http://www.nle.com

C.O.D.'s • VISA • Mastercard • Discover • Terms

Circle Reader Service No. 231

REFURBISHED PRODUCTS
NETWORKING
ROUTERS • SWITCHES • HUBS

CISCO, CABLETRON, SYNOPTICS

BAYNETWORKS, CHIPCOM, XYPLEX, WELLFLEET, IBM, KALPANA, NETWORTH, XYLOGICS, 3COM, DIGITAL, PROTEON, MADGE, HP

International Resellers of Routers, Switches & Hubs
BIZ!
Business Information Zygoun International Inc.®

NY
Tel: (315) 458-9606
Fax: (315) 458-9493
MA
Tel: (508) 667-4926
Fax: (508) 663-0607
http://www.bizint.com

On parle français. Hablamos español · Wir sprechen deutsch

Circle Reader Service No. 219

LAN/WAN...NEW/USED
3Com HUGE INVENTORY 3Com
CABLETRON SYNOPTICS PROTEON
CISCO CHIPCOM KALPANA IBM NOVELL NETWORTH
WE BUY/SELL NEW/USED/EXCESS LAN/WAN STUFF!!

NEW 3Com
509B
TPO $59
COMBO $79
900 PCI*
TP.$90 CBO $110
905TX*
$115*
*MINIMUM QTY - 3

FMS1 DEALS!
8 PORT $135
12 PORT $250
24 PORT $675
10 PORT COAX .$1125
ADD SNMP FOR...$275

FMS2 DEALS!
12 PORT $450
24 PORT $775
ADD SNMP FOR...$475

SWITCHES
12 PORT $2350
24 PORT W/TX ..$2975
10 PORT W/OC3 .$3800

NETWARE

5	10	25	50	100
$425	695	875	1195	1695

LOTS MORE - CALL

3Com (U)
FMS 2 HUBS
12 PORT $350
24 PORT $650
ADD SNMP FOR...$325
FMS 1HUBS
12 PORT $250
24 PORT $550
ADD SNMP FOR...$275
NIC ADAPTERS
509TP/CX.....$60
503-16 .....CALL
501/503/505 .....CALL
MUCH MORE CALL!!

ROUTERS
NETBUILDER
2X2 ROUTER.....$1250
NETBUILDER2....CALL
3GH..MSH..
PLEASE CALL!!
LANPLEX 2500
ONE P/S.....$2800
TWO P/S $3600
MULTICONNECT-CALL!
COMM SERVER
CS210 .....$700
CS2100 .....$850
CS2000 .....CALL
CS25/2500 .....CALL!
WE'RE AUTHORIZED FOR ALL 3COM!!!

CABLETRON (U)
E2119 .....$50
THINMIM $350
FR3000.....$450
TPRMIM22 ....$1200
TPMIM24 .....$995
TPRMIN36.....$1400
TPMIMTS $350
MT800 .....$125
TRX124 .....$1200
TRMIM-24 ....$1200
TRMIM44A $1550
MMAC3/5/8/CHASSIS
MUCH MORE CALL!!

CHIPCOM (U)
6017C-A $1800
6017C-B $2100
6000PS.....$475
5108M-TP.....$600
5101NGT.....$1200
5104M-RB $600
5000MRCTL ..$1200

TOKEN RING (U)
IBM 8228..$95
IBM 16/4 ..$100
PROTEON 16/4....$85
PROTEON MAU ..$90
3COM ROUTERS..CALL
3COM 12 PRT.$950
MUCH MORE – CALL!

MORE NEW 3Com
FAST ETHERNET
12 PORT $1750
FAST SWITCH ...$1500

SYNOPTICS (U)
3303A $550
3002PS.....$450
2715-04 .....$1250
2810 .....$750
3030 .....$300
3301 .....$300
3307 .....$995
3304ST $1495
3513 .....$900
2715B-05.....$1500
2715SAF $1600
3/5/XXX CHASSIS
PLEASE CALL!!

NEW SMC
12 PORT TP HUB$275
MISC. USED
SMC 8 PRT HUB ...$90
DATATL T1CSU....$450
NETWORTH.....CALL
VITALINK.....CALL
CX/TP XNCVR $40

KALPANA (U)
EPS1500....$750
EPP211.....$250
EPS500....$1250

ERGONOMIC INC. 47 Werman Court • Plainview, NY 11803
Purch: 516-293-5200 • FAX: 516-293-5325
WE WARRANTY! WE BUY YOUR USED LANS/WANS QTY DISCOUNTS!
VISA/MC/AMEX COD & Terms
FOR SALES ONLY CALL TOLL FREE OUR 14TH YEAR!
800-AKA-3Com (800-252-3266) U=Used

Circle Reader Service No. 271

LAN/WAN • BUY/SELL
FULLY WARRANTEED
NEW/REFURBISHED
RENTAL
LEASE

MODEMS
DSU/CSU's
MULTIPLEXERS
T-1 EQUIPMENT
HUB, BRIDGES, ROUTERS, ETC.

Fibermux AT&T Synoptics
CISCO SPECIALISTS
Cabletron Bay Networks
We carry all manufacturers, call John, ext. 101.

http://www.psyber.com/~adcs
PHONE 800-783-8979
FAX (916) 781-6962
ADCS INC.

Circle Reader Service No. 240

FOR MORE INFORMATION ABOUT MARKETPLACE
1-800-622-1108

Coming Up in April

Issue Date		Close
April 7	Comparative Product Review on web servers.	Mar. 26
April 14	Single Product Review on Ipsilon IP switch.	Apr. 2
April 21	Comparative Product Review on port switch hubs.	Apr. 9
April 28	Server Review Series - Non-Intel Windows NT Servers.	Apr. 16

Bonus Distribution at
ICE, Atlanta

To reserve your ad space call Enku Gubaie.
Direct Response Advertising
1-800-622-1108 ext. 465

Please note that comparative and single product review dates and topics are subject to change without notice.

NEW REFURBISHED BUY SELL NEW REFURBISHED BUY SELL

MSI Communications
Nationwide Services • 24-Hour Technical Support
CNE Services • Trade-In Credit

WAN Products	Distribution Products		LAN Products
Adtran	Codex	Spectron	Bay Networks
AT&T Paradyne	GDC	Symplex	Cisco
BAT	IBM	Tellabs	Compression Labs
Digital Link	Micom	Timeplex	Cubix
INC	Motorola	UDS	Develcon
Micom	Racal Milgo	Vitalink	Livingston
NET			Madge
Newbridge			Novell
Verilink			Xyplex

Specialized Products
Refurbished
CISCO SYSTEMS
AGS+, 2500's, 4000's, 7000's

Data, Voice & Video Networking
7 Waterloo Road, Stanhope, NJ 07874
TEL 201-347-3349 • FAX 201-347-7176
http://www.msic.com
An ESOP Company.....Where the Employees are Owners

Circle Reader Service No. 232

OFFERING YOU THE BEST PRICES & AVAILABILITY

3COM
BAY NETWORKS
IBM
U.S. ROBOTICS
APC
AXIS
CISCO ENTERPRISE
INTEL
ALLIED TELESYN
UB NETWORKS
DIGITAL
PROMISE TECHNOLOGY
D-LINK
MICRODYNE
SCOPE
LANTRONIX
MICROPOLIS
THOMSON-CSF

WAVENET, INC.
Distributor of Network Products
Tel: 818-255-0055
FAX: 818-255-0363
CA Order Desk:
1-888-4WAVENET
Visit our website:
www.wavenetinc.com

Circle Reader Service No. 282

CISCO
Systems/Features/Memory
CISCO EQUIPMENT
Also Available: Wellfleet, Bay, Fore, Xylogics, Livingston, & Ascend
In Stock • Fast Delivery • No Expedite Charges
COMSTAR, INC.
The #1 Network Remarketer
612•835•5502
Fax 612•835•1927 E-Mail:sales@comstarinc.com

Circle Reader Service No. 234

REFURBISHED NETWORKING EQUIPMENT
More than price & availability...
InterLink Means Customer Satisfaction!
BUY, SELL, LEASE/RENT, TRADE
Routers • Hubs • Bridges • Servers
CISCO, BAY NETWORKS, 3COM, DIGITAL, ASCEND, LIVINGSTON, XYPLEX
*All trademarks are the property of their respective owners
Technical Support • Product Warranty • Aggressive Pricing
1-800-832-6539
Fax: 612-832-0966 Voice: 612-832-9192
Email: afaris@isd.net
InterLink COMMUNICATIONS
5254 W. 74th Street; Minneapolis, MN 55439

Circle Reader Service No. 283

Awards Presented to NetworkWorld Confirm

Editorial Excellence.


NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

Bigger than its britches?

Cisco squeezes IBM

Groupware giants jockey for Web leadership role

Sun reaffirms Java control

Early users give NT 5.0 directory so-so reviews

Folio: *magazine's Editorial Excellence Awards honor publications for* ***clearly defining their mission*** *and for maintaining features, departments and design that support those editorial intentions.*

The Neal Awards *are presented annually to those editors who* ***exhibit journalistic enterprise,*** *extent of* **service** *to the field and* ***editorial craftsmanship.***

Folio:
EDITORIAL EXCELLENCE

FOLIO: *AWARD*

Information Technology Trade Category

Year End Power Issue
Issue Date:
December 25, 1995/
January 1, 1996

NEAL *AWARD*
Certificate of Merit

Best Single Issue

Tenth Anniversary Issue
Issue Date:
April 29, 1996

NEAL *AWARD*
Certificate of Merit

Best Subject-Related Series

Internet Health Report Series
Issue Dates:
September 16, 1996 and
September 23, 1996

Schmidt

Continued from page 1

"I've had six or seven hour-long conversations with him in the last four years, and I can honestly say I learned something every time, which you can't say about everybody," said David Smith, a research director of Internet strategies for the Stamford, Conn.-based Gartner Group, Inc.

What's more, he is articulate.

"He's one of those Leonardo da Vinci type of people who have a universal interest in things," said Janpieter Scheerder, president of SunSoft, Inc., a Sun division. "But you'll never feel he's talking down to you because he has a great way of synthesizing ideas and making them understandable," Scheerder said.

And he is very low-key.

"He is not like the brash Scott McNealy. He's more of an even-keel type of person," said Michael Cowpland, CEO of Corel Corp., a desktop suite firm based in Ottawa. "Somebody like Scott coming in [to Novell] might raise a few eyebrows because he is extremely outspoken. Eric is a different kind of personality."

MEET NOVELL CEO ERIC SCHMIDT

- **Recent experience:** Sun, where he's been chief technology officer since 1994. He joined Sun as manager of software in 1993.
- **Previous employers:** Xerox Palo Alto Research Center, Bell Labs and Zilog
- **Education:** B.S. in electrical engineering from Princeton University, M.S. in electrical engineering and Ph.D. in computer science from the University of California at Berkeley
- **Favorite topics:** Java and the Internet
- **Downtime:** He administrates his home PC LAN.
- **On the move to Utah?** ***"I will actually be moving into the airplane that has daily runs between San Jose and Orem."***

If there is any concern observers have about Schmidt, it is the fact that he is a techie — rather than a businessperson — at heart. That is a charge Schmidt does not deny.

"I know it sounds boring, but it is what I do in my off-time. I actually work with computers," Schmidt said. "My hobby at the moment is being the systems administrator for the PC LAN I have in my house. I helped my daughter get on the Web."

Schmidt plans to build the PCs he works with at Novell himself. It all starts with the right motherboard, he explained. When pressed on what he meant by that, he answered slowly. "In. . .tel. It is going to take a while to learn how to say things like that," he said, coyly pointing out the difference between Novell's history in Intel-based chips vs. his own with Sun's SPARC chips.

But friend, former colleague and now industry partner Rick Schell, vice president of engineering at Netscape Communications Corp., said Schmidt has always approached the competition with an open mind.

"I remember one time I walked into his office and he had an NT box sitting on his desk," Schell said. "He looks up at me and says, 'Yeah, I know Scott [McNealy] hates these things. But we can't do things in a vacuum, and if I don't try to understand this, nobody here will."

Analysts said Novell needs a strong manager as well as an outspoken, technical visionary. Schmidt said he takes a rational, objective approach to management. Former colleagues said his tactful style works.

"He is a delegator. He works with people to define goals and objectives and then helps them build strong teams to reach the objectives. He is not a micromanager in any sense," Schell said.

Schmidt hopes to establish a strong management team at Novell, building around current president Joe Marengi. "He is a superb operational manager. Frankly, I would not have taken the job without Joe being here," Schmidt said.

Colleagues also pointed to his uncanny ability to make tough decisions regarding strategic direction — like Sun's attempt to standardize Unix around AT&T System 5 or its push to industrialize Java — and rally the troops to ride them out to success.

"The thing I remember him most for is that he saved the Java project several times from political death at Sun," said Arthur van Hoff, CTO of Marimba, Inc. and former Java engineer at Sun.

"There was always a lot of arguing at Sun about how to spend money. It is important to have some good friends to help you, and he has always been a good friend of the Java project," van Hoff added.

Netscape's Schell said his friend's tenacity in those situations reminded him of the time when Schmidt decided to get serious about a mutual hobby, running, and train for the 1988 Big Sur International Marathon.

"Oh, yeah. Of course, he finished. That was his goal," Schell said. ■

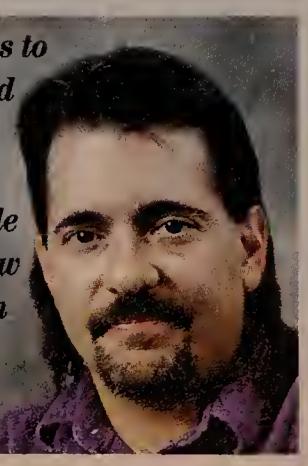
Users welcome Schmidt's 'Net expertise

Novell, Inc.'s hiring of Eric Schmidt last week as its new chief executive officer was a big hit with customers, who said he brings instant Internet credibility to a company that has failed to establish a strong 'Net presence.

"The Internet is a totally different way of thinking. Having a guy who thinks that way should turn things around for Novell," said Robert Sather, director of MIS at Mayo Chemical Company, Inc. in Smyrna, Ga.

Still, the Sun Microsystems, Inc. chief technology officer and leading Java evangelist may need to move fast to retain customers such as Sather.

"IntranetWare to me is just a straight [network operating system] upgrade. There is nothing there that makes the jump to the 'Net easy for us," Sather said. He is testing Microsoft Corp.'s Windows NT and Internet Information Server for use in his company's intranet.



"What Schmidt needs to do is get a big board and hit Microsoft between the eyes every once in a while just to let them know that Novell is still in the game."

Chuck Klucko, systems engineer, Goldco Industries

Schmidt needs to make Novell a more vocal player in the battle for 'Net dominance, according to Chuck Klucko, a systems engineer at Goldco Industries, Inc. in Loveland, Colo., and a local user group president.

"Novell's too passive," he said. "They've been bashed around by the NT people for three years. They should just spend the money, come out with a little tongue-in-cheek thing that slaps Microsoft around a bit to let them know that Novell is not going to roll over and play dead."

While customers are confident in Schmidt's Internet expertise, some raised concerns about his predisposition to Java as the premier Internet technology.

"It worries me that he is so into Java. Java is a great thing, but to bet the whole Novell farm on it would be a big mistake," said Bill Kannberg, a technology manager with a large government agency in southern Florida.

Kannberg is hoping Schmidt can live up to his track record of getting behind a technology and making it a winner.

"He must focus the company. Novell has some drop-dead code that gets kept in the backroom while products with huge limitations keep getting the big push," he said. "Schmidt will have to figure out what to bring forward and what to let die."

Joe Entler, a systems administrator with Monsanto Co. in St. Louis, said Schmidt should push Novell Directory Services (NDS) into more large corporations.

"They've already sold the small to medium companies on NetWare. But to gain ground they have to get NDS into big companies. They have to fight off NT in that space to survive," he said.

— Christine Burns

Novell, Netscape form company

By Carol Sliwa and Christine Burns

Novell, Inc. last week said it will partner with Netscape Communications Corp. to form a separate privately held company that will blend Netscape's SuiteSpot servers with Novell's IntranetWare platform.

Joining forces with what is arguably the Internet's most well-known vendor and hiring Internet visionary Eric Schmidt as its chief executive officer should go a long way toward helping Novell shed its image as a 'Net also-ran.

The initial mission of the new company, called Novonyx, will be porting SuiteSpot servers to the IntranetWare platform. SuiteSpot already runs on Windows NT and various Unix flavors. Plans also call for Novonyx to work on new products in the future, according to Novell and Netscape officials.

Novell President Joe Marengi said they opted to form a new company rather than forge a partnership because it allows them to better focus on the task at hand. "[It] eliminates all the internal conflicts that would happen inside the companies between competing contingencies, [such as Novell] GroupWise vs. [Netscape] Communicator," he said.

Both companies stressed that their alliance will not lead to product-line phaseouts. "The idea is that Novell can build its products the way that it wants to, Netscape can build its products the way that it wants to, and to have a separate entity that's able to take the best of both companies' technologies and move it forward aggressively into the marketplace using a very, very well-established infrastructure and channel," Marengi said.

Michael Cowpland, chief executive officer of Ottawa-based Corel Corp., an ally of both Novell and Netscape, said the deal makes sense to him.

"Novell's got the directory services and the industrial strength. But Netscape's got the sizzle," he said. "So it could be a great combination, when you've got the sizzle and the steak."

Novell and Netscape are providing an undisclosed amount of capital to jump-start Novonyx, which will be based in Utah.

John Paul, Netscape's new vice president of strategic development, said he expects a management team to be in place within 60 days. Within three to six months, he believes the first products will be ready: Netscape's Enterprise and FastTrack servers as NetWare Loadable Modules ported to IntranetWare.

Plans call for the rest of Netscape's SuiteSpot software to be ported to IntranetWare; officials declined to specify a timetable.

Netscape will license source code for its entire server line, which includes Directory Server, so that it will work with Novell products. ■

NETWORK WORLD, INC.

THE MEADOWS, 161 WORCESTER ROAD, FRAMINGHAM, MA 01701-9172, (508) 875-6400/FAX: (508) 879-3167

Colin Ungaro, President/CEO
Evilee Thibeault, Senior Vice President/Publisher
Mary Kaye Newton, Assistant to the President
Eleni Ansbois, Sales Associate

ADMINISTRATION
Mary Fanning, Vice President Finance and Operations
Frank Coelho, Office Services Manager
Paul Mercer, Billing Manager
Mary Rinaldo, Telecommunications Administrator
Tom Garvey, Mailroom Supervisor
Tim DeMeo, Mailroom Assistant

HUMAN RESOURCES
Mary Cornetta Brown, Vice President, Human Resources
Danielle Volpe, Human Resources Representative

MARKETING
Virginia Lehr, Director of Marketing
Kristin Wattu, Marketing/Promotions Manager
Barbara Sullivan, Market Research Analyst
Heidi Creighton, Public Relations Manager
Donna Kirkey, Marketing Design Manager
Nancy Vickers, Graphic Designer

GLOBAL PRODUCT SUPPORT CENTER
Joanne Wittren, Senior Global Marketing Services Manager

ADVERTISING OPERATIONS
Karen Wallace, Director of Advertising Operations
Ann Jordan, Advertising Account Coordinator
Marlo Matoska, Advertising Account Coordinator
Sean Landry, Direct Response/Recruitment Ad Coordinator

PRODUCTION
Ann Finn, Production Director
Greg Morgan, Production Supervisor
Cathy Sampson, Print Buying Supervisor

RESEARCH
Ann MacKay, Research Director

CIRCULATION
Deborah Winders, Vice President Circulation
Richard Priante, Director of Circulation
Bobbie Cruse, Assistant Circulation Director
Mary McIntire, Circulation Assistant

IDG LIST RENTAL SERVICES
Christine Cahill, Sales Representative
P.O. Box 9151, Framingham, MA 01701-9151
(800) 343-6474/(508) 370-0825, FAX: (508) 370-0020

PROFESSIONAL DEVELOPMENT GROUP
William Reinstein, Senior Vice President/Business Development
Debra Becker, Marketing Manager
Christie Sears, Finance/Operations Manager
William Bernardi, Senior Product Specialist
Peter Halliday, Product Manager/NetDraw
Andrea D'Amato, Sales Manager/ Strategic Partnerships
Sharon Schawbel, Product Specialist
Betty Amaro, Operations Specialist

ONLINE SERVICES
Ann Roskey, Director, Online Services
Jean-Olivier Holingue, Web Technology Manager
Pam Kerensky, Web Operations Specialist
FAX: (508) 820-1283

INFORMATION SYSTEMS/ DIGITAL IMAGING SERVICES
Michael Draper, Vice President Information Systems
Jack McDonough, Network Director
Eric Powers, Network IS Support Specialist
Anne Nickinello, Digital Imaging Manager
Deborah Vozikis, Imaging Specialist
FAX: (508) 875-3090

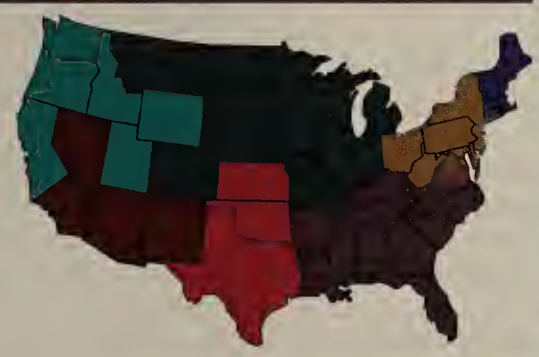
DISTRIBUTION
Bob Wescott, Distribution Manager
(508) 879-0700

IDG

Patrick J. McGovern, Chairman of the Board **Kelly Conlin**, President **Jim Casella**, Chief Operating Officer **William P. Murphy**, Vice President Finance

Network World is a publication of IDG, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. IDG publishes over 275 computer publications in 75 countries. Ninety million people read one or more IDG publications each month. *Network World* contributes to the IDG News Service, offering the latest on domestic and international computer news.

SALES OFFICES



Carol Lasker, Advertising Director
Internet: clasker@nww.com
Debbie Lovell, Sales Associate
(508) 875-6400/FAX: (508) 628-3976

NORTHEAST
Tom Davis, Eastern Regional Manager
Aimee Damiani, Sales Assistant
Donna Pomponi, Senior District Manager
Nancy Robinson, Senior District Manager
Michael Eadie, Account Executive
Internet: tdavis, dpomponi, nancyr, meadie@nww.com
Jolene Springfield, Sales Assistant
(508) 875-6400/FAX: (508) 628-3976

MID-ATLANTIC
Jacqui DiBianca, Senior District Manager
Rick Groves, District Manager, Sales Manager IntraNet Magazine
Internet: jdibian, rgroves@nww.com
Barbara Stewart, Sales Assistant
(610) 971-1530/FAX: (610) 975-0837

MIDWEST
Bob Mitchell, District Manager
Internet: bmitchel@nww.com
Anna Caran, Sales Assistant
(847) 297-8855/FAX: (847) 827-9159

CENTRAL
Dan Gentile, Midwest Regional Manager
Internet: dgentile@nww.com
Anna Caran, Sales Assistant
(512) 246-7044/FAX: (512) 246-7703

NORTHWEST
Sandra Kupiec, Western Regional Manager
Paula Connor, Senior District Manager
Susan Rastellini, District Manager
Kevin Octavio, District Manager
Internet: skupiec, pconnor, slr, koctavio@nww.com
Carol Stiglic, Inside Sales Representative
Internet: cstiglic@nww.com
Mandy Tiedje, Sales Assistant
Brenda Mays, Sales Assistant
(408) 567-4150/FAX: (408) 567-4166

SOUTHWEST
Amy C. Bartulis, Senior District Manager
Internet: abartuli@nww.com
Tracy Pennell, Sales Associate
(714) 250-3006/FAX: (714) 833-2857

SOUTHEAST
Don Seay, Senior District Manager
Internet: dseay@nww.com
Terry Sanders-Prentice, Sales Assistant
(770) 394-0758/FAX: (770) 394-6354

DIRECT RESPONSE ADVERTISING
Response Card Decks/Marketplace
Joan Bayon Pinsky, Director Direct Response Advertising
Clare O'Brien, Sales Manager
Richard Black, Account Executive
Heather Fairbanks, Account Executive
Enku Gubaie, Account Executive
Internet: jpinsky, cobrien, rblack, hfair, egubaie@nww.com
Sharon Chin, Sales/Marketing Operations Coordinator
Chris Gibney, Sales Assistant
(508) 875-6400/FAX: (508) 628-3976

RECRUITMENT ADVERTISING
Pam Valentinas, Director of Recruitment Advertising
Internet: pamval@nww.com
Carla Cappucci, Sales Associate Central U.S. Territory
(508) 875-6400/FAX: (508) 820-0607

NetworkWorld **161 Worcester Road, Framingham, MA 01701-9172, (508) 875-6400**

Periodicals postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #0385662. *Network World* (ISSN 0887-7661) is published weekly, except for a single combined issue for the last week in December and the first week in January by *Network World*, Inc., 161 Worcester Road, Framingham, Mass. 01701-9172.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-508-820-7444.

Nonqualified subscribers: $5.00 a copy; U.S. - $95 a year; Canada - $117.70 (including 7% GST, GST #126659952); Central & South America - $110 a year; Europe - $165 a year, all other countries - $245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Please include mailing label from front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zebb Road, Ann Arbor, Mich. 48106.

Network World is distributed free of charge in the U.S. to qualified management or professionals who meet ALL of the following criteria:

1) Have site purchasing influence.
2) Are involved in the purchase of network products and services.
3) Have multi-platform networks installed or planned (including network architectures, LAN operating systems and LAN environments).

POSTMASTER: Send Change of Address to *Network World*, P.O. Box 3090, Northbrook, IL 60065.

USPS 735-730

EDITORIAL INDEX

ADVERTISER INDEX

Intranet Magazine

Network World Fusion - www.nwfusion.com

3Com	Distinct	Open Connect
Anixter	Exide	Shiva
Bay Networks	LanOptics	SysKonnect
Cisco	Make Systems	US Robotics
Digital (2)	Network Appliance	US West
	Novell	Utopia

These indexes are provided as a reader service. Although every effort has been made to make them as complete as possible, the publication does not assume liability for errors or omissions.

*Indicates Regional/Demographic

DIRECTORY OF SERVICES

Hacker tool

Continued from page 1

of ability to hijack a session," said Ed Skoudis, a senior systems engineer at Bellcore, who spoke on the topic at last week's Open Systems Security Conference here.

"It's simple point-and-click. And it can defeat even the most secure authentication, such as [Security Dynamics Technologies, Inc.'s] SecurID. They can steal a session and leave it up for days," he said.

There is no recognized means of defense against TTY-Watcher, short of disallowing telnet access to your network and encrypting all the data on it, others said.

"TTY-Watcher was developed as a strong monitoring tool. Now it's used to hijack your network session," said Sean Wray, principal security systems architect at Goffstown, N.H.-based Wheeldon Integration. "I can't recognize an attack session with TTY-Watcher."

WATCH OUT FOR TTY-WATCHER

In the hands of hackers, En Garde Systems' TTY-Watcher can be used to:

- Hijack a network connection after gaining root access to a computer.
- Kick a legitimate user off the network, then pretend to be that user to make changes to the mainframe or other applications.
- Watch and capture FTP, telnet, HTTP or other interactive sessions.

While those familiar with the software said it is a growing threat to network security, they did not cite any specific cases of damage to corporate networks.

Alex Hay, chief of network operations at En Garde, said the company put TTY-Watcher up on the 'Net several months ago to demonstrate what could be done with IP-Watcher. "No one believed it was this powerful," he said.

IP-Watcher is a sniffer that can monitor all sessions on a network, allowing the user to take over any session. En Garde President Michael Neuman said the license to IP-Watcher restricts its use to a customer's IP addresses, while TTY-Watcher lets users take over just one machine.

Hay and Neuman said they had no idea that TTY-Watcher had become popular with the hackers underground.

Dangerous code

Neuman described the software as "dangerous" in the wrong hands but defended putting the freeware up on the 'Net since TTY-Watcher only works when hackers have gotten the root password and logon for a local machine.

"After they've broken into the system, it's all over anyway," Neuman said. He pointed out that there are three or four other freeware tools like TTY-Watcher online, such as TAP.

The problem is that breaking in to get passwords and IDs is becoming easier than ever, according to security experts. For example, hackers have been busy upgrading Crack, the software that guesses passwords by brute-force attack.

"The new version of Crack 5 allows the load to be shared across a network, allowing things to go faster," Skoudis said.

There are also more stealthy versions of Rootkit, the Trojan-horse program that gives you a camouflaged backdoor into a computer system. "There are new versions for Linux, Solaris and HP-Unix," Skoudis said. These newer Rootkits are harder than ever to detect, he added.

The hackers underground are also working hard to take advantage of whatever weakness they can find in Microsoft's NT, Skoudis said. ■

Security flaws plague Microsoft's FrontPage, digital cellular systems

In a preemptive security strike, Microsoft Corp. last week acknowledged that its FrontPage product has a security flaw that could let someone browsing a Web site alter pages created with FrontPage 1.1 for Windows or FrontPage '97.

The company advised Web site operators, including Internet service providers, to immediately download the new FrontPage server code, which is said to fix the problem, from www.microsoft.com/frontpage.

Microsoft employees spotted the flaw in the FrontPage Server extensions a few weeks ago and rushed to create a patch before some smart hacker made it headline news.

Only Web sites hosting the FrontPage Server extensions that contain the "save results" and "discussion" webot components are said to be affected. According to Microsoft, it would take someone highly knowledgeable in HTML to exploit the flaw.

In other bad news, Microsoft last week was told that the software patch it made last month for the security hole, which twas discovered in its Internet Information Server 3.0 cannot prevent the same attack by another means.

The attack involves adding a simple "." in ASCII format to the end of Active Server Pages. This addition gives you the source code for the pages, which acts like CGI scripts. Microsoft's Hot-Fix patch of last month created error-checking code for this vulnerability, but it does not prevent someone from carrying out the same attack using hexidecimal code "%2e" to view the Active Server Pages, according to Christopher Klaus, president of Atlanta-based Internet Security Systems, Inc.

Meanwhile, Digital cellular systems, advertised as being more secure than their analog counterparts, also took a hit last week. An expert team of cryptographers revealed they have designed a program to break what's known as the Cellular Message Encryption Algorithm (CMEA). Now widely used in digital cellular phones, CMEA is intended to keep eavesdroppers from seizing credit-card and personal ID numbers.

Bruce Schneier, president of the Minneapolis-based consultancy Counterpane Systems, announced that he and his associate, John Kelsey, with help from Berkeley graduate student David Wagner, exploited the poor design of the 56-bit CMEA algorithm so it was as easy to break as a far shorter, weaker one.

Schneier said the "closed-door process" conducted by the Telecommunications Industry Association (TIA) when they designed the algorithm, prevented a public review, which would have brought the problem to light. He also faulted the National Security Agency for undue influence over export controls.

—Ellen Messmer

NetworkWorld

Editor in Chief: *John Gallant*
Editor: *John Dix*

NEWS

News Editor: *Doug Barney*
News Director: *Bob Brown, Phone: (508) 875-6400*
Enterprise Editor: *Charles Bruno, Phone: (407) 381-7801; Fax: (407) 381-7903*

NETWORK WORLD FUSION

Online Editor: *Adam Gaffin, Phone: (508) 820-7433*
Online Senior Writer: *Todd Wallack, Phone: (508) 820-7532;* **Fusion Designer:** *John Fischer*

WANs & INTERNETWORKING

Senior Editor: *Michael Cooney Phone: (703) 807-2903; Fax: (703) 807-2909*
Senior Editor: *Jim Duffy, Phone: (508) 820-7525*
Senior Writer: *Tim Greene, Phone: (508) 820-7422*

CARRIER SERVICES

Senior Editor: *David Rohde Phone: (202) 879-6758; Fax: (202) 347-2365*
Senior Writer: *Denise Pappalardo Phone: (202) 879-6745; Fax: (202) 347-2365*

LOCAL NETWORKS

Senior Writer: *Christine Burns, Phone: (508) 820-7456;* **Senior Writer:** *Jodi Cohen, Phone: (508) 820-7449*

CLIENT/SERVER APPLICATIONS

Senior Editor: *John Cox, Phone: (508) 834-0554, Fax: (508) 834-0558;* **Senior Writer:** *Paul McNamara, Phone: (508) 820-7471*

INTRANETS & THE NET

Senior Editor: *Ellen Messmer, Phone: (202) 879-6752, Fax: (202) 347-2365*
Senior Writer: *Carol Sliwa, Phone: (508) 820-7427*
Senior Writer, Business and the Internet: *Chris Nerney, Phone: (508) 820-7451*

COPY DESK/LAYOUT

Managing Editor: *Michele Caterina*
Copy Editors: *Sandra Gittlen, Stephanie Noyes*
Layout Editor: *Wendy Hodgson*

ART

Design Director: *Rob Stave*
Associate Art Director: *Tom Norton*
Senior Designer: *Allyson Nickowitz*
Graphic Designers: *John Fischer, Paul M. Lee*
Graphics Coordinator: *Pauline Chouinard*

FEATURES

Features Editor: *Paul Desmond, Phone: (508) 820-7419, Fax: (508) 820-1103*
Managing Editor, Features: *Jim Brown, Phone: (508) 820-7408, Fax: (508) 820-1103*
Associate Features Editor: *Susan Collins, Phone: (508) 820-7413, Fax: (508) 820-1103*
Senior Editor, Features: *Kathy Scott, Phone: (508) 820-7489, Fax: (508) 820-1103*

REVIEWS

Test Center Director: *Lee Schlesinger Phone: (508) 820-7416*
Director, Network World/PC World Server Test Center: *William Rinko-Gay Phone: (713) 376-8771; Fax: (713) 251-7857 E-mail: bill_rinko-gay@pcworld.com*
Test Alliance Partners: *Todd Coopee, Trinity College; James Gaskin, Gaskin Computer Services; Steven Goldberg, +G Systems; John Ketchersid III, Latsu, Inc.; Bob Larribeau, Larribeau Associates; Howard and Kristin Marks, Networks Are Our Lives; Edwin Mier, Mier Communications, Inc.; National Computer Security Association; David Rorabaugh, Venture Computer Services; Joel Snyder, Opus One*
Contributing Editors: *Daniel Briere, Mark Gibbs, James Kobielus, Edwin Mier, Mark Miller, Alan Pearce*
Buyers Guide Contributors: *Tony Croes, Linda Musthaler, Currid & Co.; Mark Miller, DigiNet Corp.; James Kobielus, LCC, Inc.; Edwin Mier, Mier Communications, Inc.; Daniel Brierr, Melodie Reagan, Christine Heckart, Liza Henderson, Beth Gage, TeleChoice, Inc.*
Teletoons: *Phil Frank, Joe Trouse*

INTRANET

Executive Editor: *Beth Schultz, Phone: (773) 283-0213, Fax: (773) 283-0214;*
Senior Editor: *Peggy Watt, Phone: (415) 903-9519, Fax: (415) 968-3459*
Art Director, Intranet: *Tom Norton*

Assistant to the Editor: *Cheryl Crivello*
Office Manager, Editorial: *Glenna Fasold*
Editorial Assistant: *Pat Josefek*

OpenView

Continued from page 1

- Contains unclear documentation.
- Requires knowledge of the Network Computing Services (NCS) remote procedure calls.
- Takes too long to configure.
- Is unwieldy.
- Makes OpenView harder to install and activate.
- Is prone to failure in dynamic network environments.
- Is difficult to maintain and troubleshoot.
- Is unfamiliar to HP support personnel, who in turn are unresponsive.
- May compromise network security.

"We have had some problems with iFOR/LS, mostly related to when we changed the address of our server," said Sandra Potter, network specialist at Air Products and Chemicals, Inc. in Allentown, Pa.

"It's a little overly complicated so hopefully [HP] will simplify it a bit," Potter said.

Another user at a large financial services firm in Baltimore also is open to a change.

"I would dearly love to see them go back to some relatively simplistic approach," the user said.

HP said it plans to address the OpenView licensing concerns to the point of considering replacing iFOR/LS.

HP is now implementing a node-locked licensing mechanism in OpenView so users can sidestep iFOR/LS and NCS.

To accelerate customer support-call resolution HP said it provided in-depth training in iFOR/LS last month for its customer response centers.

In addition, the company plans to host a birds-of-a-feather session at the OpenView Forum conference in June to discuss licensing problems and workarounds.

Gradient, meanwhile, still has a close working relationship with HP, a company spokesman claimed.

"They are a long-term and important partner on a number of fronts, licensing being only one of them," the Gradient spokesman said.

"We have no notification from HP that they're going to be abandoning iFOR/LS anytime soon," he said. ■

HP'S RESPONSE TO THE OPENVIEW LICENSING SNAFU

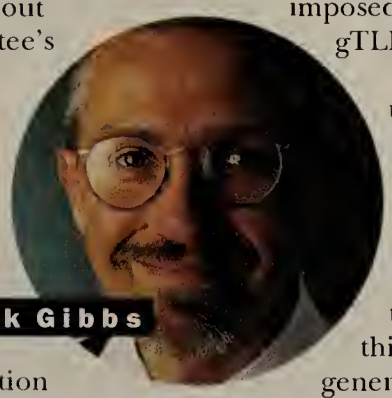
- Train the Customer Response Centers on iFOR/LS to accelerate call resolution.
- Host a licensing birds-of-a-feather session at the OpenView Forum in June.
- Implement node-locked licensing so customers can abandon Network Computing System (NCS) and iFOR/LS.
- Evaluate replacing iFOR/LS and NCS.

Backspin

The virtual soap opera: A twisted plot

I am not generally a fan of soap operas. In the past, I've followed one or two (remember "Dallas"?). But these days I just don't have time to tune in and veg out. However, the ongoing Internet Network Information Center (InterNIC) soap opera is definitely one I want to follow.

A few weeks ago, I wrote about the Internet Ad Hoc Committee's plans to create seven generic top-level domains (gTLDs) such as .shop and .web, along with 28 registries.


Mark Gibbs

Now the history of the whole registry thing goes right back to the roots of the Internet. In the beginning was the National Science Foundation (NSF, which had a very big hand in the development of the 'Net. Back when the Domain Naming System started, the NSF had taken responsibility for managing the Internet. This was practical when only a hundred or so machines were connected.

But then the 'Net started to grow. And eventually, the NSF decided that managing the Internet was too big a task. The work consisted of allocating address spaces, registering names and providing the services that mapped those names to addresses.

The InterNIC was always somewhat bureaucratic, but as the workload increased it became progressively more difficult to deal with.

The NSF's solution was to establish the InterNIC. By some selection process I haven't ever investigated, the grants for this work were awarded to AT&T and Network Solutions, Inc. (NSI).

Back in 1993, when I wrote a book called *Navigating the Internet*, a reply from the InterNIC for a domain registration took about three working days. Within 12 months, it had grown to three weeks.

The InterNIC was always somewhat bureaucratic but as the workload increased it became progressively more difficult to deal with. (The kind ones amongst you might say, "But they were doing their best. After all, the whole operation was being funded on grants so it can't have been easy." But a lot of folks out there have serious grievances over how they were treated.)

As the Internet grew from large to huge to enormous over the past few years, the InterNIC realized there was a simple way both to fund its work and show a profit. So, as of Sept. 14, 1995, a $100 registration fee and $50 annual maintenance fee were imposed on those names in all five gTLDs.

While this doesn't sound too unreasonable, the transition from the freewheeling 'Net to this "officially" managed environment has bug-ged a lot of people. I, for one, often wonder who died and made the InterNIC king. Do you think it's OK for the InterNIC to generate revenue of around $51 million in its first partial operating year and to be looking $1 billion in the eye for 1997? And remember, behind the InterNIC are AT&T and NSI, two organizations not exactly devoid of profit motive.

And once again, the lousy service issue raises its ugly head. Over the past several months, we've discovered that, for one reason or another, domain name registration information is often out of date or simply wrong. So when the InterNIC recently shut down 9,272 domains because the domain owners hadn't coughed up the requisite fees, there were a lot of ticked off people out there.

As if all this nonsense wasn't bad enough, the profit potential has drawn Uncle Sam back into the game. In a 17-page confidential report (which I guess wasn't all that confidential), the NSF's Office of the Inspector General (a watchdog group to make sure that the NSF is being properly run) recommended the NSF aim for world domination. Well, it recommends that the NSF take over domain registration and management to "recoup some of the government's investment in the Internet."

'Scuse me? The government's investment was *our* investment! We paid for it. What we have here is opportunism, greed, profiteering, special interests and skullduggery.

Watch out, this soap opera is just building up a story line, and if we're not careful, there could well be a nasty twist in the plot.

Tune in next week, same time, same station? Story lines to nwcolumn@gibbs.com or pitch me on (800) 622-1108, Ext. 504. (Analyzing humor is like dissecting a frog. Few people are interested in it and the frog dies of it.)

'Net Buzz

The latest on the Internet/intranet industry

By Chris Nerney

ONLY YOU HAVE THE RIGHT TOUCH Imagine gaining access to your intranet with a mere touch of a finger.

A Princeton, N.J., security vendor aims to make that possible with the release of an intranet access tool based on individual **fingerprint encryption.**

International Creative Technologies, Ltd. (ICT) says its CyberTouch system uses biometric security technology to create a unique digital code from an employee's fingerprint for each person on a company's intranet. ICT officials say because CyberTouch is Java-based, it runs across all platforms.

The advantage to biometric security is that, unlike security devices such as passwords and ID numbers, a finger image cannot be lost, stolen or transferred to another person. (Unless, of course, some real mayhem ensues.)

ICT is the second company this year to announce fingerprint-based intranet security. In January, **GridNet International,** a network services provider based near Atlanta, said it would incorporate biometric security into its qwikLINK intranet package (*NW,* Jan. 6, page 1).

CyberTouch is scheduled to be available May 1. Licenses will start at $995 per workstation.

MAYBE THERE SHOULD BE A '.SUE' DOMAIN If there is opportunity in chaos, the confusion and uncertainty surrounding the **Internet top-level Domain Naming System (DNS)** should make a few people — most likely lawyers — rich.

Less than two months ago, the Internet Society (ISOC) supposedly brought order to the DNS by ratifying a proposal to create new top-level domains.

The plan also called for the selection of new domain registries to compete with Network Solutions, Inc. (NSI), which has been the sole registrar under a government agreement.

ISOC's decree was greeted in many circles with an enthusiasm usually reserved for martial law. A group of ISPs and renegade registries recently pledged allegiance to something called the "enhanced Domain Name System" (eDNS), a rival naming structure due to be running by April 1.

And then there are the lawsuits. Earlier this month, NSI said it had been named in about 25 suits. Last week another was added to the list when PGP Media, Inc. filed an antitrust suit against NSI, arguing that the Vienna, Va.-based registry is a monopoly. (PGP Media, based in New York, also does business as name.space, and is not affiliated with encryption provider Pretty Good Privacy, Inc.)

To sum up: We have ISOC, the DNS and NSI against eDNS, PGP and whatever other acronym can afford to hire a lawyer.

Cyberspace is fast becoming like boxing, where an alphabet soup of governmental bodies compete to run the show. If **Don King** starts registering domain names, we know there will have been a crossover.

EYE ON THE IPO A vendor that markets an Internet firewall for IBM Application System/400s has announced it is going public.

Vision Solutions, Inc. of Irvine, Calif., plans to offer 2.3 million shares of public stock at a price range of $10 to $12. The company intends to trade on NASDAQ under the symbol VISI. No date for the stock's issuance has been set.

Vision's **IP/400-Internet Proxy** is a fully automated object mirroring system for the AS/400. Formed in 1990, the company also makes software for data warehouses and computer clusters.

'Net Buzz lives by one golden rule: Never, ever make fun of other people, unless they are smaller and weaker than you. Please keep that in mind as you send us your best Internet and intranet news. Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.

The Simplest decision you'll make all week.

SuperStack II PS Hub 40

Special Introductory Pricing Offer*

*Buy a 12-port SuperStack II PS Hub 40 for only $199***

*Buy a SuperStack II Switch 1000 for only $1999***

Solutions[3]

Integrates effortlessly with the SuperStack II Switch 1000 to deliver an instant Ethernet bandwidth boost.

The newest hub from the world's leader.
An incredible introductory offer.
The only decision left is how soon you want it.

Need a basic hub for an unmanaged workgroup? Need a segmentable hub for your managed workgroup? No problem. 3Com's SuperStack II™ PS Hub 40 can be both.

SUPER STACK®

Our 12- and 24-port TP versions just plug in to connect. Stack them up to 10 high and run. The 3Com +5 Lifetime Limited Warranty backs you all the way. PS Hub 40 features the industry's most advanced segmentation – at no extra cost – for improved manageability and performance. As standard you get all 9 RMON groups of management for complete control of the network.

Add a SuperStack II Switch 1000, and your network will kick on its afterburners. The only bad news is the special introductory offer won't last. Call now to qualify! Get this hub on Monday and you might be able to take the rest of the week off.

DataComm MAGAZINE TESTER'S CHOICE WINNERS 1996

1-800-NET-3COM (option 4)
www.3com.com/superdeal

* While supplies last. Offer expires 5/31/97. Offer limited to one SuperStack II PS Hub 40 and one SuperStack II Switch 1000 per qualified customer. Customers purchasing a Switch 1000 must also purchase a PS Hub 40. Offer applies to 12-port versions only (3C16405 and 3C16901A.) Offer not available to resellers, distributors and Federal Agencies. Offer valid only in the U.S. and Canada. Void where prohibited by law. May not be combined with any other program or promotion. All purchases will be per 3Com terms and conditions. **U.S. dollars.

3Com®

We don't brake for international borders

when it comes to moving the world's traffic.

Your business knows no boundaries. That's why Sprint has worked to become the world's leading carrier of Internet traffic. In fact, we were chosen by the National Science Foundation to operate one of the largest Internet traffic hubs in the world. Plus, we offer global connectivity with a full portfolio of Internet and intranet services. We designed our IP network to offer you optimal connections to anywhere on the Internet– Sprint also operates the only OC-3 IP link across the Atlantic. And we're the only carrier with a separate intranet network, devoted exclusively to business traffic. The result? You enjoy the utmost in data security. You also receive complete support with 24x7 monitoring available, plus firewall software and hardware, custom access and alert systems – even investigation support–for added security. Sprint is *Network Computing*'s Editor's Choice for IP services in 1996, the only carrier to receive such praise. The reasons are clear: Sprint's experience and visionary approach to the Internet are helping you meet the challenges of global data transport today, and tomorrow.

Only Sprint

carries over half the globe's Internet traffic, bringing a world of experience to your IP services.

Call Sprint Business

1·800·588·DATA

www.sprint.com/data1

Sprint®

OFFICIAL TELECOMMUNICATIONS PROVIDER TO THE NFL™

We help business do more business℠